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## *The Metropolitan Board of Works and the Gas Companies.*

THE considerations which, on the 3rd ultimo (*ante*, p. 580), we laid before our readers as to the proposed amalgamation of the Gas Light and Coke and the South Metropolitan Gas Companies, appear to have had full weight with the advisers of the Metropolitan Board of Works. The *Times*, indeed, appears to assume that it is rather with an eye to the future extension of its own powers than for any other reason that this body has now come forward to do its best to prevent the amalgamation. Into that question, thorny as it is, we do not propose to enter, though we may be allowed to say that there is no vice in the management of public business of which the *Builder* has been a more consistent opponent than that of deciding important questions on a side issue. To the expedient of dealing with architectural or engineering questions on political lines, for instance, the greater part of the confusion now existing in much of our legislation is attributable. But we must confess that we see no very evident signs of this sideways action in the observations made by the Metropolitan Board of Works on the scheme of amalgamation. The protection of the South Metropolitan district from the imposition of charges higher than those now imposed on it, to which we referred as essential, has been put in the front of the case raised by the Metropolitan Board. That Acts of Parliament are not to be overridden by Orders in Council is another point made by the Board, as to which the argument is so strong that we have not felt it necessary to bring it forward. We cannot conceive that such an order would be sanctioned that should limit or reduce public rights existing under statutory provisions; nor do we suppose that the order would hold good if it thus infringed on the law. At the same time, it is perhaps well that no mistake should be possible under this head; and that in carrying out any change agreed on by the companies for their mutual advantage, the rights of the consumers should be clearly maintained, and their position shown to be rather improved than deteriorated.

If, however, this safeguard be duly maintained, it is not easy to see that any very great economical advantage is to be derived from the amalgamation. The river Thames forms a practical boundary of gas and water districts, the effect of which must be to make any fusion of a north and south district partake more of the nature of a federation than of unification. At the present time the cost of producing a given quantity of gas is nearly 20 per cent. higher in the Gas Light and Coke Company's district than it is in the South Metropolitan district. The figures in 1882 were:—For coals and working expenses (less residuals), per 1,000 cubic feet of gas sold, 21·95d. in the former, and 18·37d. in the latter. This difference mainly arises in the cost of coal and the returns from residuals. As for working expenses alone, the prices come out at 14·70d. and 14·78d. per 1,000, or substantially at the same amount. On the other hand, it may be noted that the cost of management (which is included in the above 14d.) is nearly ¼d. per thousand more for the smaller than for the larger company. This is neither unnatural nor objectionable. At the same time, it may be taken to show that the margin for saving by uniting the managements is small, as the total cost, not only of the directors and auditors (which might be reduced), but also of collectors, of salaries, and of general charges, only amounts to 1·05d. per 1,000 cubic feet for the Gas Light and Coke Company, and to 1·45d. per 1,000 for the South Metropolitan Company.

There may, of course, be other elements of advantage in consolidation, of which the directors of the respective companies are probably the persons best able to form an opinion. The usual gain to be derived from absence of competition can hardly come in here; or, if it do, it must, we apprehend, be at the cost of the consumer. We can only deal with positive cost. That is, as we have said, considerably less south than it is north of the river. And not only is this so as to coals and working expenses, but interest on capital, in spite of the much larger extent of the district served by the Gas Light and Coke Company, follows the same rule. The net profit per cent. on stock and share capital raised, which in the Gas Light and Coke Company is 10·04 per cent., rises in the case of the South Metropolitan Company to 12·05 per cent. The total dividends on stock and share capital raised are 10·28 and 11·68 per cent. respectively. One important item of comparison is omitted in the annual returns of the gas companies; nor do we find it supplied either in Mr. Field's "Analysis of the Metropolitan and Suburban Gas Companies' Accounts," or in Mr. Firth's "Municipal London." We refer to the area served by each company. In the case of the water companies we know both the area included in Parliamentary powers and the capital, and we can thus calculate the respective cost of the several services for interest on capital or in any other way that may be desired. In the case of the gas companies this demarcation of area is yet a desideratum, and we can regard only the cost of capital, without being able to see how it has been laid out, as regards area. The total raised capital of the Gas Light and Coke Company is 9,656,147*l.* (for 1882); that of the South Metropolitan is 2,092,221*l.* The only means that we have of estimating how far this capital outlay is proportioned to the actual services rendered by the respective companies is by taking the account of the number of tons of coal carbonised by each. These were, 1,305,216 tons for the Gas Light and Coke Company, and 418,722 tons for the South Metropolitan Company, in 1882. If we compare the above figures we find that the capital of the former company has been laid out at the rate of 7·4*l.* for every ton of coal carbonised in the year, and that of the latter at the rate of 5*l.* for every ton; the southern company thus having made a more economical outlay of capital by 40 per cent., nearly, as regards work done on a given outlay. When this remark is added to those before made as to the comparative cost of coals and working expenses, it will be seen why the South Metropolitan stock should be the more valuable of the two. We may also understand that several reasons may exist for the swallowing up of the smaller company by the larger. But taking, as we have done, exact figures, it becomes difficult to see how this absorption should profit the shareholders of the purchasing company, except at the cost of the consumers. And if that be really contemplated, South London will owe a considerable debt of gratitude to the Metropolitan Board of Works for thus coming forward to take the bull by the horns.

That the South Metropolitan Gas Company "presents, and has presented for many years, an excellent standard of comparison, and a stimulus to beneficial rivalry as regards other companies," as stated by the Metropolitan Board of Works, is an outcome of the figures that we have above given. The Board also take the same view as that for which we have given chapter and verse as to the doubts to be entertained of the margin existing for reduction of cost of management. If the proposal for which the sanction of an Order in Council is sought, is intended to have the effect of raising the standard or initial price for the South Metropolitan district by 3d. per 1,000 cubic feet, as understood by the Board of Works, we conclude that such a proposal would, of itself, be enough to wreck the scheme. "Of course," as we wrote on the 3rd of November, "the amalgamation can make (or, at all events, should be allowed to make) no difference in this respect." Both companies, as it is, are under the provision of the sliding scale, which has added 1·79d. per 1,000 cubic feet of gas sold to the dividend of the Gas Light and Coke Company, and 2·36d per 1,000 to that of the South Metropolitan Company. There is thus no feeling of need or pinch of poverty in the matter; and if the

companies see that their own interests promise to be materially advanced by the amalgamation, it will be for them to show that those of their customers are as fully protected.

It may be asked what is the lowest cost at which we may look forward to the production of gas for metropolitan use. In the first instance, in the attempt to reply to this question, we have looked through the analysed expenditure of the existing companies, and taken the lowest price for each item. We must admit that this plan is liable to the objection that some slight differences in management, or in the mode of keeping accounts, may throw an expense that is returned under one head by one company into another column in the accounts of another. With that reserve we give the following figures. The lowest price for coals (or, rather, the highest returns for residual products, leaving the lowest net cost for coal) is in the South Metropolitan Gas Company, and is as low as 3·59d. per 1,000 cubic feet. The least manufacturing charges are those of the Commercial Gas Company of 8·51d. per 1,000. The lowest cost of distribution is 1·70d. per 1,000 in the South Metropolitan district. Taking for the remaining items of rent and taxes, management, Parliamentary and law charges, bad debts, public officers and testing officers, depreciation of works on leasehold, and other charges, the lowest figures in each case, we have 3·05d. for the lot, making a total of 16·85d. per 1,000 cubic feet of gas sold. The lowest gross profit earned is by the London Company, being 11·64d. per 1,000 cubic feet, which, as the standard dividend is 9·83 per cent., we will call 11·86 for a 10 per cent. dividend. The net cost thus arrived at, allowing 10 per cent. dividend, is 28·71d. per 1,000 cubic feet of gas sold; and, making allowances for cross entries, as before said, the division of 10 per cent. to the shareholders seems to be incompatible with a price to the consumer of less than 2s. 6d. per 1,000 cubic feet. With regard to the proportionate outlay of capital, which, in the Gas Light and Coke Company we found to be 7·4*l.*, and in the South Metropolitan 5*l.* per ton of coal used in the gross, in the London it is 5 3*l.* for every ton annually carbonised, and over the average of the four urban companies it is 6·5*l.* per ton. If we add a proportionate allowance for the excess of the average capital over that of the London Company above taken, it gives a cost of 32·68d. per 1,000 cubic feet, or a little more than 2½d. per 1,000 above the half-crown before roughly arrived at. This is less than 2d. per 1,000 below the lowest price obtained for gas rental, which is 34·24d. by the South Metropolitan Company. Thus, again, we come to the remark that the actual performance of this company approaches very nearly to what we may regard as the best result likely to be practically attainable in London.

There has, indeed, been the suggestion made, that the production of gas should be conducted at the bottom of a coal mine or mines, and that the gas in its purified state should be sent through a duct or tube extending from the coal districts to London. We are not aware how far the eminent man to whom the idea owes its origin has brought it to the test of figures. The inquiry is worth a little attention.

More than two million tons of coal are now annually carbonised by the four great London gas companies. The volume of gas produced is something over twenty-one milliards (or thousands of millions) of cubic feet. If we divide this formidable total by the number of seconds in a year, the quotient gives a flow of 666 cubic feet per second through the whole time. The question of the velocity with which the gas should be driven through the duct, of the frictional resistance offered by from 150 to 300 miles of pipe (according to the coal field selected for production, and of the forcing arrangements by which this resistance is to be overcome, are points as to which it is premature now to enter into detail. At the velocity of 1 ft. per second the area of cross-section of the tube would be 666 ft., or thirty per cent. over the size of an ordinary railway tunnel. This area would, of course, be diminished in proportion to the excess of speed in the current over 1 ft. per second; while the frictional resistance, on the contrary, will increase with the square of the velocity, which, in this case, will be inversely as the size of the duct. When we come to think of the cost of land, works, and machinery for a connexion of this kind, we think it will be long before the screw collier finds its occupation gone.

It will be on all accounts to be regretted if any misunderstanding should be allowed to exist as to the amalgamation proposed. If it be calculated, on sure data, to effect an economy in the price of London gas, it is only necessary for the promoters to show, first, that such is the case, and secondly, how the consumer is to partake of the advantage, in order to receive warm support. If neither of these things can be shown, and if there be any ground for the suspicion that by watering the stock of the more costly company by an absorption of that of the more economical concern a benefit is to be ensured to the gas proprietors, accompanied by any infringement of the exceptionally good position of the South Metropolitan consumers, it is only necessary to bring this into clear daylight to insure the rejection of the measure. Doubt there ought to be none; for if ever a case has to be decided on its unmistakable merits, such a case is now before the public.

## THE ARCHITECTURE OF ENGLISH FICTION.

"As we read in those delightful volumes the England of our ancestors is revivified. Out of the fictitious book I get the expression of the life of the time; and the fiction carries a greater amount of truth in solution than the volume which purports to be all true."—Thackeray.

As the English drama attained at a bound the highest conceivable pitch of perfection, so it was with the English novel,—a fact which has often been noted, but which never ceases to astonish us with every fresh recognition of its force and meaning. All other arts have been slow and gradual in their ripening. The crowning excellence of Greek sculpture was the result of centuries of effort. The progress of the sister art of painting was tardy and tentative. In architecture, the course of its development from the Early Doric, which was doubtless the elaboration of an Egyptian model, to the later refinements of the Ionic or the graceful exuberance of the Corinthian style, the space covers the rise and fall of dynasties and empires. With us the long series of years which elapsed between the imported art of our Norman neighbours and the full development of the purely native Decorated and Perpendicular styles, embrace nearly the whole of our national history. We count the steps by decades, and the pace is so slow as to be almost imperceptible. But the first work of pure fiction still remains amongst the highest achievements of the literary artist, and no one expects to see the Elizabethan drama approached in its essential features, to say nothing of its ever being surpassed by the ages to come.

It is a little unfortunate, perhaps, that the time which marks the rise of the novelist's art was, so far as architecture is concerned, a time of artistic dearth. The indigenous styles had died out, and the alien manner which succeeded them was practised, not as a free and living art, but as a mere branch of recondite learning. In this character it imposed upon the boldest minds, and its canons, ill understood, had an awful and mysterious power. Ordinary men had no personal views or opinions on the subject of the art, or at least none that they dared express and abide by, and had only one, if any, ambition concerning it, viz., to ascertain what the *cognoscenti* held, and receive their *dicta* implicity. We nowhere see the sway of this influence more strongly exercised than in the case of the daring and original mind of De Foe. Although his fame hangs mainly upon one work which is more a school-boy's book than anything else, he was the most voluminous author in his time. And not only so, but he was one of the most original thinkers and the most fearless advocates of what he thought whom England has ever produced. His activity was unfortunately for us limited too narrowly to petty political squabbles and intrigues. But the ingenuity and labour of modern admirers of this writer have succeeded in rescuing from oblivion many of the almost countless works which, under one pseudonym or another, flowed for half a century in never-failing copiousness from his pen. In the majority of these there is no reference to architecture to be found. His mind was exercised in far other directions. But in the tour through Great Britain which he published as written "by a gentleman" in 1723-8, we get not only a multitude of interesting facts and acute observations on the England of the time; but numerous glimpses of architectural works, many of them now no more. And it is curious to see the attitude which the writer assumes, as he is variously confronted with the ancient art which he really admires, as a man of his ardent imagination must necessarily do, and the modern manner which had everywhere displaced the ancient, and the merits of which he accepts on the assurance of those whom he conceives to be much better judges than himself. In some instances he is under obvious restraint in presence of the Mediæval remains. He passes Durham Cathedral and Castle, and the picturesque beauties of Chester, with a shrug of the shoulders. At Ely, he limits his speculations to the question how much longer the cathedral can escape complete ruin, and how it happens that destruction has not overtaken it before. As he turns away without a word of praise for that marvellous triumph of the genius of Alan of Walsingham, you might think him insensible to the charm of the fabric, were it not that the beauty of King's College Chapel at Cambridge excites his warmest admiration. He is often betrayed into expressions of genuine appreciation of the old residences of the Elizabethan nobility, but invariably makes a concession to the prevailing opinions by qualifying his admiration with some such phrase as "though in the ancient taste," reminding one of Thackeray's sea-captain, who loved his wife as well as when he first married her, "although she had borne him fourteen children." He sets down the tower of St. Michael's, Cornhill, built in 1723, as "one of the finest Gothic pieces in London," and has these judicious remarks upon the characteristics of Gothic and Italian architecture: The latter is not really heavy, he says, but only so in comparison with the extravagant airiness and lightness of the other. In Gothic, the designer is bound by no rules of proportion, but what his own fancy suggests. In Classic art the height of every arch "hath a fixed proportion," the doors, windows, and ornaments the same. The intercolumniations and their entablatures are all confined to certain admeasurements. But who, he triumphantly asks, "ever found that exactness observed in any Gothic structure?" Nevertheless, he does, when giving way to his unlearned instincts, dilate upon the charms of Gothic structures, and in the presence of the portentous works which were then rising on the country estates of the great ones of his day, invariably slides off, after giving a few dimensions of the principal front and a reference to their "fluted pillars, triangular pediments, and other beautiful decorations," into a description of the noble vistas and the artificial lakes which appear to have been one of the chief concerns of their owners. Speaking of Burleigh House, "Burleigh House by Stamford Town," he has this curious passage:—"The grandfather of the present earl had a great genius for architecture, and superior judgment, as every part of this noble structure will testify; *for* he changed the whole face of the building. He pulled down great part of the front next the garden, and turned the old Gothic windows into those spacious *sashes* which are now seen there." In another place he notes that a building has been "sashed in the Tuscan order," getting a little out of his depth, but still dwelling on the improvement of the sash over the old crazy casements of the earlier buildings. In these we get a clue to the whole architectectural feeling of the time. We noted before* how the old chronicler seized upon the "forcrazed" character of the dilapidated old manor-house.

Pepys, that ever-charming gossip, in dining with one of his many aristocratic friends at a country seat, notes the discomforts of the old mansion, that the doors have no fastenings, and blow and bang about, with the draughts which freely enter through the ill-glazed and ill-fitting windows. The years succeeding the Restoration mark the rise of a sense of fastidiousness in all the domestic arts and surroundings, and our ideas of comfort date from thence. The life of the house is no longer centred in the hall, and the inmates are no longer insensible to discomforts which their forefathers despised, inured as they were by their rougher outdoor lives, and finding a "natural and prompt alacrity in hardness." Consequently, the parlour and the closet, or private sitting-room, are now universal and indispensable, and we now almost for the first time find a library in every house of the most ordinary pretensions.

The novels of Richardson give us a clear idea of the ideal dwelling of the early years of the eighteenth century. We cannot expect to find

* See p. 780, *ante*.

in the long, almost interminable, series of letters, of which his delightful fictions are composed,—letters for the most part written by one love-sick maiden to another,—very frequent direct references to the architecture of the day. "Their hearts were otherwhere." But we do get incidentally much positive information on that head. The idea of everything that is repellant and disagreeable is expressed by the "moated house" to which Clarissa is to be sent and kept in durance vile. The only notions of excellence in domestic architecture which escape from the pens of his fair correspondents turn upon comfortably-appointed rooms. A "stately, well-ordered, and convenient house," with a pretty library added to make it "more commodious" is the highest reach of their ambition in this direction. The phrase, "a stately, well-furnished and convenient house" recurs frequently throughout Richardson's works, and formulates his views on the point quite exactly. The house which is to be prepared for the divine Pamela is to be more plain than rich, as well in its furniture as in its wainscot, the bed-chambers are to have oaken floors, the parlour doors are to have brass locks and hinges, and are to be so constructed as to fit as "close as a watch-case,"—Mr. Pepys's view having now generally prevailed, you see! In the house for Pamela's aged parents the old bow-windows are to be preserved, but they are in this instance not to be sashed, only to have larger panes and more convenient casements to open and shut, and let in the sweet air and light; but this concession to the picturesque is to heighten the charms of the larger and more stately mansion when "Mr. B." shall return thereto. In the City, Mr. B., looking out for a handsome house, found it in the then new buildings "called Hanover-square." In the country he is engaged in cutting vistas through groves aligned upon windows and balconies,—in planting woods and walks, and building alcoves; and in all the writers of this age the same view,—a by no means unreasonable one,—of the essentials of a good house is held and expressed or implied in all they write bearing upon the subject. There is no thought of looking backward with regret at the irregular and fantastic beauties of the buildings with which their Stuart forefathers adorned the land. They regard their own doings with a serene and supreme complacency; and as they doubtless believed the preposterous hoops, the powdered head-dresses, and the rest of their costume the most elegant and becoming ever invented; so they, no doubt, considered the handsome new buildings in Hanover-square the highest reach of art. The fiction of this period is composed of love and gallantry, eating, drinking, and horse-play, and, beyond these, the writers and those for whom they wrote do not appear to have had a single idea. Richardson has by far the most refined mind of the great novelists of which he was the head and leader, and we have seen that now and then he lets us into the secret of his preferences in the art of architecture. Fielding would appear to have scarcely any appreciation of art,—he drops a few words in admiration of Greenwich Hospital, which give us a clue to his taste being quite in accord with that of his time so far as he may be said to have had any taste in art matters. Smollett simply ignores architecture altogether. He takes his heroes all over the Continent, and nearly all over the world, and passes Rouen, Amiens, Paris, Brussels, without the least indication of there being anything in the architecture of these places to call for a casual reference. He walks their antique streets with a constant leer not pleasant to note. His whole energies are bent upon the invention or record of low intrigues, laughable complications arising from the pursuit of what passed for love, and boisterous practical joking. This apathy need not strike us with surprise; there is not much about architecture in the "Pickwick Papers"; the object of the author was to raise a laugh, and neither he nor his audience were very particular as to the means employed; but the works which were most popular at the time give us an insight to the manners and morals of the time, and we see a temper of mind which is not calculated to receive the impressions of art, or to fit men for its highest achievements. The few who accomplished works of undoubted merit were rather a protest against the age in which they lived than a sample of their generation. After a season of remarkable apathy a reaction set in, and architecture formed one of the most universal and engaging studies of all who pretended to any education. In considering the reviving claims of pure art we shall find ample materials,—materials which are absent from the works of the novelists of the seventeenth and eighteenth centuries, whose æsthetic creed, from Temple and Smollett, may be stated in their favourite formula, ease, convenience, elegance, and, in exceptional cases, magnificence, cold, formal, and stately. Of picturesque beauty they had no sense. Beyond personal ease and comfort a mechanical symmetry,—"the last resource of mediocrity,"—satisfied all their desires on the score of art.

## IMPRESSIONISM IN SCULPTURE.

In considering this subject, it must be remembered that our distinct ideas of naturalistic, conventional, or what is now called impressional treatment are essentially modern. They are the progeny of the original idea of imitation, which have become detailed and specialised in the gradual development of art. This law applies to all human workmanship; to poetry as well as to the arts of visible design. More than that, it is characteristic of the handiwork of nature herself, and is illustrated in a wonderful manner by the series of palæontologic forms.

The conventional form which, at so early a date, was assumed by Egyptian art, may probably be attributed to no more noble cause than the want of inventive skill on the part of the workman; that want being a characteristic of his race, and contrasting forcibly with the opposite quality in the Greek artists, among whom it has usually been more easy to invent or to modify, than slavishly to copy. We may see the same variety exhibited at the present day among children, or among those workpeople who are still in a similarly undeveloped stage of art education. One youthful student, eager to produce work of an exactness that shall satisfy his eye, while it is beyond the skill of his hand, will work by templates. If he had a regiment of cardboard soldiers to make, he would trace them all from the first of the file, and would thus produce a regular, if somewhat unmeaning, series of mimic soldiery. Another lad, working with the same object, will give a somewhat different proportion and attitude to each of his miniature host. The Egyptian artists did the former. Having arrived, whether by the road that we suggest, or by any other, at a delineation of the form of a king or a god which was, if not altogether satisfactory, the best at their command, they endeavoured to perpetuate the symbol. This is not matter of opinion. We know the rules by which they worked. We have found, in some of the unfinished tombs, the lines by which the work was set out,—a series of parallel lines, interspacing the chief points of the figures; and during the long period that stretches back from the age of the Ptolemies to that of the first Egyptian dynasty the canon has only twice been varied. Conventional rule, thus slightly modified, has been adhered to in the Valley of the Nile for more than 4,000 years. But we regard this rule, not as in any way resembling the effort of the modern designer to give a certain degree of non-natural rendering to a vegetable or animal form for a definite purpose, but as having been resorted to as affording the readiest means by which workmen not naturally of great artistic gifts might carry on the traditions of the founders of their art. The forms are what we now call conventional. To the Egyptian they were the best imitation of nature at his command. He was not advanced enough to dissect the art idea,—to separate outline and colour, repose and motion. He reproduced an Isis or a Pharaoh as closely as he could as a copy of the Isis or the Pharaohs that had been venerated at least as far back as the time of the last previous change of dynasty, or of political and social order.

The Greek sculptor,—we know but little of the Greek painters,—passed in a lifetime through more study, thought, and change, than the Egyptian artist had undergone in, perhaps, several centuries. In so doing,—we know, from the Apollo of Tegæa and other ancient relics how near Greek art was to Egyptian art at the time of the birth of the former,—they separated the ideas of outline and of colour, of motion and of repose. Thus sculpture was born. We have lost very much of the intermediate history, owing to the fact that the education of the Greek sculptor was carried out by working in bronze, and that the intrinsic value of the material led, in most cases, to the destruction of old works of art, in order to realise their metallic value. What Phidias and his school and successors did, in our opinion, was to introduce a new material, and to exert on the lovely substance furnished by the quarries of Paros and of Pentelicus the craftsmanship which the profession had acquired by their labours in clay, in wax, in bronze, and in the precious metals.

Of the wedlock between the art of Phidias and the marble of Pentelicus, sculpture, in its present and noblest form, was born. The moment was propitious. The degree of skill attained by the artist was not at its acme, but was in its grandest stage. In the short time that elapsed down to the period of Alexander the Great, the art of cutting marble advanced very considerably. But the skill displayed was at the expense of the true art feeling. The wonderful excellence of portraiture attained by Pyrgoteles and his contemporaries was, in itself, greater than that of Phidias. But even the magnificent rendering of the features of Alexander, which was reserved to two or three specified artists (approached only since that time by some of the Italian medallists, and by the English die-sinkers of Carolinian times) is devoid of that sculptural grandeur which sits on the passionless features of the Phidian marbles.

It is possible that, from our present standpoint, looking at such magnificent fragments as are to be found in the British Museum, we may even form a purer idea of abstract sculpture than did the Greek masters in whose works we find the most signal examples of that excellence. For there is no doubt that gilding and staining were not altogether dissociated from sculpture in the time of Phidias. Even marble was so treated; and the chryselephantine statues, which we should not, with our present views, admit to be pure sculpture at all, were among the most highly valued works of Phidias and his school, not in the opinion of the masses alone but also in that of the artists themselves. Thus that elevated conception of sculpture which can see so much more poetry in a fractured torso than in a figure made presentable and perfect by the file and the cement of Bernini, is probably rather the result of a retrospect of the progress of art than an idea consciously wrought out by the first masters of antique sculpture.

From the days of these chryselephantine statues to our own, then, there has existed, side by side with whatever was present in the traditions of the sculptor of the day, the influence of the impure, of the mixed, of what may be called the impressional. We see it wherever there is a mixture of materials, of variously-coloured marbles, of alabaster and bronze, of wood and gold. Works thus produced, while often displaying admirable skill, and even high taste of a certain order, are, in our view, rather furniture than sculpture. By the aid of adequate lighting such works may be made almost deceptions. But so can modelling in wax; and when a cast taken in wax from a face is put on a lay figure which may be attired in the actual dress of the person thus commemorated, deception, or, to revert to our starting-point, imitation, is carried to its acme. But it is not sculpture; nor is it, we hold, legitimate, or, at all events, high art.

The tendency to produce this bastard form of impressional sculpture is rather on the increase than otherwise at the present day. We may refer to one item. Roubiliac was at one time almost alone among sculptors as giving that indication of the iris, or pupil of the eye, which is found in some of his finest busts, notably in his autographic portrait, which is before us as we write. Even this mode of giving life to a face has been criticised, although, when work thus treated is compared with broad open eyes of uniform deadness between the lids, there can be little hesitation as to which is the finest work. But in the modern French *terra cottas*, whether of a grotesque or of an erotic character, this rendering of the pupil becomes positively obtrusive. We find it in some of the Mediæval work, notably in the Della Robbia busts and figures, but nowhere do we find it so pushed to caricature as in the French *terra cotta* of the day. It has made its way into the Italian studios. In this we consider that we find not only impressional sculpture, but work essentially of a base and ignoble character, although it may be a faithful and wonderful transmission of the idea which the modeller intended to embody.

We can mention another case, the experience of which is deserving of record and of attention. It was the case of the production of a very humble effect,—only the execution of a few wooden heads of about one-quarter life-size, for the purpose of a miniature theatre. The heads were designed and executed by an artist who usually wrought in ivory, a material which admits of a combination of boldness and of delicacy in a way attainable in no other instance. The little heads were set in a vice, and rapidly struck out with a carpenter's mallet and chisel. The effect, after a very brief time of work, was admirable. There was character,—the intended character,—in each. Not content with this, the artist then betook himself to smooth off the rough parts, and give a fair finish to the heads. But as he did so, the life and fire departed, and finally he arrived at nothing but common-place dolls. The fault, we take it, lay rather in the material than in the workman. But in the rough heads there was the impressional character of the sketch,—which presented a life and fire beyond that which wood could support if treated like a nobler material.

In sculpture, therefore, the artist is limited in his effects by the nature of the material on which he works, in a manner which none but a practical man can realise. Thus, if it be desired to produce a delicate design in an ivory relief, the work will be altogether different if executed in that pure delicate ivory known as "green ivory," in which the grain of the tusk is almost imperceptible; in the soft yellow grainless ivory, called Egyptian, which bruises almost like human flesh; or in the ordinary coarse-grained ivory of India. The effect of material in controlling style reacts on the artist, and the sculptor who succeeds in ivory will probably fail in wood; while, on the other hand, the process may be reversed, and most objects executed in ivory are essentially wooden in style.

What the crayon is to the painter, clay is to the sculptor,—the means of embodying his first thoughts in hastily-sketched outline. And as some of the sketches of the greatest artists,—we have in mind more especially a Saint Anne of Leonardo da Vinci,—may seem to breathe more of the true inspiration of art than does the finished rendering of the subject in oil, so it may be that a bit of baked clay has a beauty which evaporates in the attempt to translate it into marble. But such facts only show that the hand of the artist is not educated to the level of his imagination. The excellence of the sketch, instead of being regarded as an ultimate aim, should be taken only as a step towards the more perfect excellence of the finished work. Loss of fire or of grace in translation is due, not to the failure of the artist's conception, but to the imperfection of his mastery of his tools. And this brings us round again to the real secret of all those attempts at founding new schools of art amongst ourselves at the present day, in which, with more or less (generally less) excellence of workmanship there is always blended a something that is obnoxious to criticism. The secret is, that the artist omits an essential portion of his proper work, in order to give more emphasis to another portion. Wishing to avoid blurred outline, for instance, he altogether omits aërial perspective. Anxious to avoid hard lines, on the ground that he cannot detect them in nature, he produces smudge. Wishing to preserve the freedom of a sketch in clay, he sends to the furnace an odious caricature.

For let it be remembered that there is a profound truth in the apothegm, *ars longa*. While science is rapidly advancing, art has long since reached an excellence in sculpture, painting, and architecture which our utmost hope can only be to maintain. Of all the gifts which the advance of science has placed at our command, we can only mention one which is of material service to the artist. That is, the command of the mathematical theory of perspective, in which we have made a great advance since the time of Leonardo da Vinci. It is true that in some noble paintings,—remarkably in some by Rubens, where distant landscape is thrown in as background to portraiture,—the want of perspective knowledge is not apparent. The artist painted the landscape as he saw it, and he drew it truly. But, on the other hand, there is no certitude that such will be the case; and there are many examples to the contrary. In knowing, or having the means of knowing, how a given object will look from a given point of view, the student of to-day has, it is true, a great advantage over the master of three centuries ago. But in other respects,—we may, perhaps, say in all other respects,—the student of the present day stands on lower ground than his predecessors. Even as to the manipulation and materials of the artist this is the case. Who can now dip his brush in the brilliant scarlets of Botticelli, or in the pure blues of Perugino? Why do the beauties limned by Sir Joshua look like pale and melancholy ghosts by the side of the ever buxom youth of Palma's daughter? Full as the history of art is of the efforts of artists to discover the lost secrets of the ancient colourists, it is but full of the record of failures.

The first advance, then, towards a true elevation of the art of the present day must be, it seems to us, rightly to understand where and in what respects the summit of excellence has already been attained, and faithfully to study the examples. It may be said that the artist should copy, not the works of art, but those of Nature. But what there is of truth in the remark is only truism of the most paltry kind. Who but the true artist ever sees nature? And what pretence has that man to be regarded as an artist at all, whose imagination is not kindled by being enabled to look at nature through the eyes of those who were deep in her most cunning secrets? Study, no doubt, may be partial and misdirected. It is lamentable to see, for example, in the sketch-book of so refined a draughtsman as Flaxman, not one note of the living beauty of Italy; that is to say, of the women of Italy, in pages where every relic of Roman art, poor as it usually is, is so assiduously copied. Flaxman's eye was too coldly fixed on the reflection of departed grandeur. If he had drawn inspiration from the forms and faces which no one can dwell long in Italy without meeting, he might have given us the classical type as it yet lives and moves in Magna Grecia, instead of a reflection, in marble, of a faded copy, also in marble, of the heroic life of 2,000 years ago.

Those who think with us will not differ from the conclusion, that the impressional is to be found in sculpture as well as in painting; that it may usually be characterised as "the slovenly"; and that the duration of any pretended school of which the *ratio entis* is the omission of one or more essential elements of true art, will be as transitory as its error deserves.

## NOTES AS TO SOME COLOSSAL NEW RAILWAY BRIDGES.

Mr. William Hemingway Mills, M. Inst. C.E., in the course of an address recently delivered by him as President of the Institution of Civil Engineers of Ireland, said:—

There are so many large and important works recently finished, as well as others now in course of construction or approaching completion, that it would be next to impossible to follow up the history and particulars of each. There are, however, some of them which, from peculiarity of position or originality of design, are of special interest to engineers. In the Forth Viaduct, East River Bridge New York, and Kinzua Viaduct on the Erie Railway, we have three enormous works, each one of a totally different character.

The *Forth Viaduct* presents us with a striking departure from the generally recognised arrangements for long-span bridges. The hitherto unattempted great span of 1,700 ft. has led to the adoption of the system of cantilevers and central girders, and in the working out and completion of this great work we shall obtain valuable practical information of a system of which our experience has hitherto been limited to theory or experiment. The peculiar features of the undertaking have called for unusual care and attention to all matters of detail. The enormous surface and weight of the structure itself, taken in conjunction with what must be allowed for as a possible moving load, has demanded special consideration in all matters of foundations, strains on materials, lateral stability, and wind pressure. Steel will play an important part in the construction, as the use of this material, with its increased strength per square inch as compared with wrought iron, will result in the saving of a large amount of dead weight. In point of magnitude this viaduct will be unrivalled. Its length will be over a mile, divided into two spans of 1,700 ft., two of 675 ft., fourteen of 168 ft., and six of 50 ft. In the large or 1,700 ft. span, each cantilever will be 675 ft. long, with a depth of 350 ft. at the piers, and each central or connecting girder 350 ft. long by 50 ft. deep. These enormous weights, placed at a height of 150 ft. above high-water mark, will be carried on substantial piers of masonry. It is estimated that this viaduct will cost between one-and-a-half and two millions. The undertaking of such a large and expensive work simply to avoid a detour serves to illustrate the growing importance that is attached to expedition in transit. Doubtless the commercial advantages to be gained in the saving of time and distance were well studied before the outlay was sanctioned, or we should not see the commencement of a work which must be not only exceptionally costly in its construction, but also a source of very heavy annual expense in inspection, painting, and maintenance in the future.

The *East River Bridge*, connecting New York and Brooklyn, is an example of the suspension principle on its grandest scale. The idea of connecting New York and Brooklyn by means of a bridge originated many years ago, but the difficulties and objections raised to a number of piers in the waterway caused the scheme to be laid aside, and it was not until the success of the great suspension bridges at Niagara, Cincinnati, and elsewhere, had been fairly established, that the project was again brought forward. The large spans and small obstruction to the waterway, offered by the suspension principle, together with the growing demand on the part of the public for more direct and expeditious communication between the opposite sides of the river, led to the revival of a scheme on a much larger and more comprehensive scale, and to this the world is indebted for a bridge which is not only the largest of its kind in every way, but may be fairly taken to represent all the latest improvements of details which previous experience have suggested. The total length of the bridge is 5,989 ft., of which the length of the main span is 1,595 ft. 6 in., and of each of the side or land spans 930 ft. The height from the lower floorway of the centre of the main span to the water-level is 135 ft. 6 in., and from the roadway at the piers to the water-level, 119 ft.; height of arch of the towers of the piers above the roadway, 117 ft., and total height of the towers above the roadway, 159 ft. The size of the towers at high-water level is 140 ft. by 59 ft., and at the top or roadway level, 136 ft. by 53 ft. The width of opening through the towers is 33 ft. 9 in. The full width of the floorway is 85 ft., carried by four steel wire cables, each 15¾ in. in diameter. These cables are so arranged as to provide for a raised platform or promenade, about 15 ft. wide, for pedestrians, along the centre of the bridge. On each side of this promenade there is a line of rails for railway carriages and wagons, and outside of these are the roadways, 18 ft. 6 in. wide, one on each side of the bridge, to carry the ordinary carriage, cart, and tramway traffic. Each cable is 3,578 ft. long, and contains 5,434 steel wires. In splicing or coupling the wires of the cables, a different method was adopted to that generally in use. Instead of filing the two ends to a flat taper, and then binding with fine wire, the two ends were screwed, the one with a right hand and the other with a left hand thread, and then by means of a steel coupling tube with corresponding right and left hand threads, the two ends of the wire were brought into close contact, and a strong even joint was obtained. The cross girders, or floor-beams, are 85 ft. long, or the full width of the bridge. They are of the lattice type, and made of steel. Much time and money was expended in getting in the timber caissons and foundations of the New York and Brooklyn towers; and some idea may be obtained of their magnitude when we observe that the size of the former was 172 ft. by 102 ft., and of the latter, 168 ft. by 102 ft. The depth of the New York tower foundations was 78 ft. 6 in. below high-water mark; and this tower, as completed, contains 46,945 cubic yards of masonry. The depth of the Brooklyn tower foundations was 44 ft. 6 in. below high-water mark, and the completed tower contains 38,214 cubic yards of masonry. The cost of this great bridge, which combines accommodation for ordinary road traffic, foot passengers, tramways, and railways, is estimated at nearly 3,000,000*l.* sterling, exclusive of the purchase and compensations of the land and building property.

The *Kinzua Viaduct*, on a branch of the Erie Railway, in the State of Pennsylvania, is remarkable for its great height and the lightness

and peculiar arrangement of the iron piers or towers. Situated at a high level, on a spur of the Alleghany Mountains, the roadway of the viaduct is 2,065 ft. above sea level. It may be interesting to note that this spur forms part of a water-shed whose waters flow north into the Gulf of St. Lawrence, east into Chesapeake Bay, and south into the Gulf of Mexico. Designed to save about eight miles of a *détour*, and to avoid long lengths of heavy gradients, this viaduct has been completed in very short time, and at a very moderate cost. The total length is 2,051 ft., and greatest height 301 ft. from rail level to bed of stream. It consists of twenty-one spans of 61 ft., carried on abutments of masonry and intermediate piers of light iron-work. The main girders are of the usual lattice type, and weigh about 6 tons each. They are placed at 10-ft. centres, and carry the roadway on the top. The piers or towers consist of iron columns, braced together horizontally by lattice struts, and diagonally by iron rods. These piers, each formed of four main columns, are only 10 ft. wide on the top in a transverse direction to the viaduct, one column being placed under each main girder, but they are 38 ft. 6 in. long in the direction of the viaduct. The columns have a spread or inclination outwards in the transverse direction of one-third of the height, so that the size of the base of the highest pier is 103 ft. by 38 ft. 6 in. at the level where the feet of the iron columns rest on the small piers of masonry. The roadway is, therefore, carried upon a series of lattice girders of spans of 61 ft. and 38 ft. 6 in. alternately. The proportion of span to height differs so much in this viaduct to what has hitherto been adopted in several works of a similar nature, as to form an interesting study for engineers. The piers or towers, however, claim our principal attention, as they introduce a novelty and boldness of conception which appears to have been carried out most successfully. Being for a single line, the width of pier on top had to be kept to 10 ft., the distance found to be the best for spacing the main-line girders, but by making the top length 38 ft. 6 in., and by giving so much rake to the columns in the transverse direction, each pier has a very wide base, especially arranged to insure stability and effectually resist any overturning influence. The weight of these lofty columns themselves, together with that of a passing train, taken in conjunction with the strains arising from the fact of the columns being placed one-third from the vertical, has called for unusual care and attention in the designing and proportioning of the different parts of the structure. The viaduct is calculated to carry a moving load of 3,075 lb. per lineal foot, with a factor of safety of 5. It is stated to contain 3,500,000 lb. of iron (1,562½ tons), and to have cost 275,000 dols.

Besides the preceding there are many other bridges of recent construction embodying novelty in design and variety in application which must be of much interest to the profession.

The iron arch bridge over the Douro in Portugal is a striking example of one way of carrying a high-level railway over a waterway without the obstruction of intermediate piers. The clear span is 525 ft., and height from low-water mark to the underside of arch at the crown is 198 ft., being 30 ft. higher than the Falls of Niagara. The bridge is for a single line of railway, and consists of two ribs, placed 12·96 ft. from centre to centre at the crown, and 49·21 from centre to centre at the springing. The weight of the ironwork in the arch itself is stated to be 504 tons, and of the girders, supports, and permanent way over the arch 223 tons, making a gross total weight of the central opening of 727 tons. The rolling load was calculated not to exceed 24 cwt. per lineal foot.

In the railway bridge over the Elbe at Hamburg we have a fine example of the double-bow girder. This bridge has three spans of 316 ft., and four spans of 70 ft. The roadway carries two lines of railway and two footways. The double-bow girders, of which there are two to each span, are wrought iron, and are placed between a line of rails and a footway. Local circumstances compelled the adoption of a low rail level, and on this account the underside of the roadway is only 6 ft. above the level of the highest-known floods. The total amount of ironwork in one of the large or 316-ft. spans is 572 tons, made up of 418 tons in the two double-bow girders, and 154 tons in the roadway and horizontal bracing.

We have a very handsome specimen of the simple bowstring principle in the bridge carrying the North-Eastern Railway over the River Wear at Sunderland. There are two girders for the double line of rails. The clear span is 300 ft., with a depth in the centre of 42 ft. The height from high-water level to underside of girder is 86 ft. The girders, which are of wrought iron, are fixed at one end, and are free to expand on rollers at the other. Each girder weighs a little over 500 tons, or, taking the two together, with the cross-girders, roadway, and permanent way, the total weight of the superstructure is about 1,069 tons.

## CONTINENTAL NOTES.

FAMILIAR as is Italy and the many phases of its artistic history, there is, we think it will be admitted, a large field open to the new journalistic venture which commences its existence in Rome with the New Year. *L'Art en Italie* is to be published in French, and is to keep the world interested in matters artistic, fully acquainted with all the art doings of the Italian peninsula in painting, architecture, sculpture, archæology; and, apparently on the principle of Nimrod's "dash of religion" in his sporting communications to a famous clerical journal of the past, there is to be a "dash of fashion" to please the more frivolous subscribers. With contributors such as those who have so far promised their support,—among these we may mention the well-known connoisseur *principe* Odescalchi, a familiar figure in the foreign colony of Rome,—the new venture should have before it a long career, with so rich a fund of material to draw upon as the artistic industry of Italy, Modern, Renaissance, and Classic.

While the art of France can be directly traced as an outcome of the art of Italy,—be this said in all due deference to the delicate artists who adorned the cathedrals of Chartres and Amiens long before the advent of the Pisan school,—it is none the less a fact familiar to all acquainted with the artistic history of Europe that France, after "the discovery of Italy" by Louis XII., succeeded the once classic peninsula as the world's arbiter in taste; and before long struck out an entirely original style. Nothing can more distinctly prove the marked originality of French art at its culminating point than the characteristic collection of eighteenth-century objects which, for the purpose of enriching a Parisian charity, has been gathered together at M. Petit's well-known rooms in the Rue de Sèze. The Rothschilds, the Emperor of Russia, Sir Richard Wallace, and a host of other connoisseurs, have generously laid the contents of their cabinets at the disposition of the organisers of the exhibition, and the success of the show is already immense. By a curious coincidence we in London are to see this winter a selection of characteristic creations of our eighteenth-century art, in the exhibition of works by Sir Joshua Reynolds at the Grosvenor Gallery, and in the several Romney and Gainsborough and other last-century masters brought together by the Royal Academy. The comparison is not uninstructive, and let us hasten to say, in the direction of pictorial art, singularly advantageous to England. The walls of the gallery in the Rue de Sèze may glow with historic portraits and charming *genre* subjects by Boucher and Greuze, by Nattier and Drouais, Chardin, Tocqué, Fragonard, Lancret, Watteau, and Pater. Madame du Barry may display her frail charms as depicted by the luscious brush of Boucher; such a show stands but poorly by the side of a gallery of Reynolds's characteristic, honest, solidly-painted, simple, truly English portraits of the men and women of the fashionable world of London a hundred years ago. In the specimens of French industrial art, such as the delicate *objets de vitrine* exhibited, we have, of course, to yield the palm to France, as all will frankly admit who are familiar with the skill of the French enamellers, the jewellers and goldsmiths, the chasers, the fan-painters, and the cabinet-makers, choice specimens of whose powers are exhibited in the Rue de Sèze. France has, of course, to some extent contrived till recent years to retain her reputation in the industrial arts; but, of late, the spread of art education in England, Germany, and the United States has largely tended to assail the long-admitted superiority of the French. The question, as our readers are mostly aware, has been well taken in hand. In addition to the Museum of Decorative Art, the lottery for the formation of which on a scale rivalling our South Kensington Museum is occupying at the present moment no small amount of Parisian attention, the Paris municipality are actively encouraging the spread of sound industrial instruction. Within a few days past the Tenth *Arrondissement*, or parish, has opened a school of "applied art" in the Rue des Petits Hôtels, on the principle of that already existing in the Rue Ste. Elizabeth, and in which young workmen, in the morning and evening, are enabled to learn, gratuitously and with the encouragement of bursaries, drawing, geometry, modelling, and the history of art,—subjects which, in their application to industry, have each and all to be followed by the pupils. In the Tenth *Arrondissement* school the several industries of that busy neighbourhood, ceramics, glass, enamel, wood-carving, metal work, and tissues are especially studied. As a step in the same direction, we learn that a school will shortly be opened in the midst of the Faubourg St. Antoine, the great furniture neighbourhood, the Curtain-road of Paris, with a view to the special education of young cabinetmakers and upholsterers. The municipality have also determined on the formation of a large reference-library of works on industrial art. Competition, as some of our more advanced artistic philosophers have perhaps only too clearly proved, may have disastrous effects on art; but do we not see here a possible advantage in this awakening from the apathy of decaying tradition into which the industrial arts have been only too surely falling since those declining days of the Empress Josephine, in whose "cultivated court" a brilliant contemporary dramatist has told us that "art stopped short"? England, fortunately, has less to reproach herself with in this direction; France has frankly admitted she had much to learn from our system. Let but our young artists and art-workers resist the too all-invading,—some term it agnostic,—spirit of modern society, and all may go well for the near future.

The authority of experts in matters artistic has been rudely shaken of late in our country, and singularly inconsequent, ignorant, and impertinent have been the remarks which, within a few days past, have found their way into our leading journals respecting the discredited opinion of a representative body of Academicians. By a curious coincidence the authority of artistic experts is shortly to be appealed to in the French courts in the question of deciding the authenticity of a picture by Corot. Apart from the fact that such a decision is far more difficult in the case of a picture than in that of a piece of sculpture, we have not the least doubt that the opinion of the eminent expert (a member of the Institute) called in will be unanimously accepted. Such an inconsequence as believing that in matters artistic the practised eye of the professional artist is of no more value than that of the first comer would be impossible in a community trained to a proper appreciation of the serious nature of the artist's pursuit. The decision of the two trials, though dissimilar in character, will singularly serve to show the difference of the two societies gathered, one on the banks of the Thames, the other on those of the Seine.

With all its refinements, the civilisation of Paris none the less breaks down from time to time. Paris is suffering at the present moment in a manner very similar to the great English metropolis, and "horrible Paris," like "horrible London," shows to the observant eye, familiar only with the brilliancy of the Champs Elysées and the "strangers' quarter," that Paris, like every well-arranged French flat, has its *cabinet noir*. Doubtless from the fact that the French capital enjoys a centralised and rational form of government, crying grievances can be more readily attended to than in a community regulated like our own by an apparently inextricable confusion of conflicting authorities. A recent decree of the Prefect of Police is levelled at the terrible condition of the numerous *logements garnis*, or furnished lodging-houses, which serve as the home of a vast number of the floating population of Paris. Speculators, as in our country, have been battening on the proceeds of acres of unwholesome and overcrowded dwellings,—a state of affairs which will be largely checked by the present law. No owner of property will henceforth be allowed to let out rooms the height of which is not at least 2⅔ mètres (8 ft. 1¼ in.), and containing a cubage of air equal to 14 cubic mètres (something over 18 cubic yards) for each occupant. The flooring is to be of some completely non-absorbent

material, so as to permit of frequent washing. The rooms must be adequately ventilated by open grates or other similar simple means; while as a further precaution the proprietors are to be held to some extent responsible for the conduct of their lodgers. Owing to the number of inspectors the French Prefect of Police has at his disposition,—a number which will be increased for the new service,—there will be few of the difficulties which are encountered in our country by the absurd insufficiency in the staff of officers employed, and by the limited powers of inspection at their disposal, two of the features which the intelligent members of "the force" have never failed to bring forward as important reasons for the revolting yet unknown condition of many portions of "horrible London."

Our admirable metropolitan contemporary, the historic *Courrier de l'Europe*,—which takes a fresh lease of life with the new year,—announces a probable international exhibition at Brussels. In the mean time the *Courrier*, it may be mentioned as interesting to some of our readers, undertakes to manage all formalities of admission, space, &c., at the forthcoming Continental exhibitions of the next three or four years,—the electric exhibition at Turin in May, the Pesth international exhibition of 1885, the Berlin international exhibition of 1886, and that at Rome in 1887.

We learn that the bureau of the Paris Société Centrale des Architectes has renewed its "bureau" for the forthcoming year as follows:—president, M. Questel, of the Institute; vice-presidents, M. A. Normand and M. Joly; chief secretary, M. Lucien Etienne; treasurer, M. Feydeau; and *censeurs*, MM. Bailly, Uchard, and Henard.

## CHIMNEY CONSTRUCTION.

CIVIL AND MECHANICAL ENGINEERS' SOCIETY.

At the second meeting of this society for the present session, held on the 19th inst., the paper read was on "Chimney Construction," conjointly prepared by Messrs. R. M. Bancroft and F. J. Bancroft. The paper was very completely illustrated by plans, sections, &c.*

The authors commenced by observing that since the reading of the paper on the same subject by Mr. R. M. Bancroft read, in January, 1878,† numerous inquiries had been received on the subject from all parts of the United Kingdom and America, owing to the interest and importance of the subject, and in consequence of these inquiries they had been led to continue their investigations in this branch of architectural and engineering construction.

Chimneys are constructed principally for two purposes,—firstly, to create the necessary draught for the combustion of fuel; secondly, to convey the noxious gases to such a height that they shall be so intermingled with the atmosphere as not to be injurious to the health of the neighbourhood.

A chimney-shaft when in work contains a tall column of heated air, which, being lighter than the outside atmosphere, is forced up by a corresponding column of atmospheric air pressing into the entrance of the furnace; thus a displacement of hot air is constantly being effected, and its place filled by normal air forcing itself through the furnace of the boiler, which in its turn is heated and displaced. The column of atmospheric air and the column of rarefied air in the chimney are somewhat like a pair of scales, or the two ends of a lever of which the boiler is the fulcrum.

*Foundations.*—In building large chimneys one of the most important points is the construction of the foundation. Very much will depend, of course, upon the nature of the ground. When we are on solid rock, it is only necessary to excavate to such a depth that the heat of the gases will not materially affect the natural stone, and to a depth sufficient to allow the necessary spreading of the base. In many instances, however, chimney stacks have to be built near rivers and on sites where the upper strata are of alluvial clay or made ground, and it is necessary to carry the foundation deep down until a stiff clay, hard sand, or rock bottom is reached; this frequently entails excavation 25 ft. or 30 ft. deep or even more, and it is not only requisite that the foundation should be large enough to carry the superincumbent weight, but also that it should be of such an area that it will not allow the base to be forced into the yielding-ground. These deep foundations are usually constructed of concrete. In some cases piles are driven in to form the foundation, as, among others, in a brick chimney erected at Boston and in an iron chimney constructed at Ohio, U.S.A. This is a measure on which the engineers must decide upon the advisability of using it, so as to economise material without risking unequal subsidence, which cannot be too carefully guarded against; and, in fact, it is the practice in the erection of tall stacks to construct the foundation and pedestal, if any, and allow them to stand some considerable time before proceeding with the shaft proper, in order that the work may set and any slight settling take place before a great weight is built upon it.* As a remarkable instance of the general settlement of the foundation of a shaft, we may mention a chimney which was built by Mr. Clegg, at Fulham, over a quicksand in which an iron rod sank to a depth of 15 ft. with little more than its own weight as pressure. During the erection the concrete foundation sank bodily 1 ft. 4½ in. without cracking the shaft or causing it to deviate from the perpendicular. From this it will naturally follow that in all cases the ground at the foundation should be equally resistant, or unequal settling will take place, as in the disastrous case of the Newlands Mill chimney, Bradford. Some of the pressures exerted upon the foundation are given under the respective descriptions of the chimneys.

*Copings and Cornices.*—The stone coping or cornice of a chimney will seldom require more to hold it together than two good cramps across each joint; they should be of copper, or double-dovetailed slate dowels. On no account should iron cramps be used, as they will oxidise and burst the stone. Heavy and large caps are often the source of great danger, inconvenience, and expense, as the cap at top in a gale of wind acts upon the shaft as a weight at the end of a long lever. The cap when finished should be a complete whole, or so bound together that the joints cannot open, and be so proportioned that its centre of gravity is within the outer circle of the shaft on which it rests, and it should be designed so that the wind striking against it is deflected upwards.

*Bond.*—In large factory chimney-shafts, the longitudinal tenacity which resists any force tending to split the chimney is of more importance than the transverse tenacity, therefore, in these structures, it is advisable to have, say, three or four courses of stretchers to one course of headers. In some circular stacks a uniform header-bond for the outside courses of brickwork is adopted. This is a practice condemned by some authorities.

*Wind Pressure.*—It is usual in this country to estimate, as the maximum pressure, 55 lb. per square foot, but, as in 1868 the pressure of wind at Liverpool was registered at nearly 80 lb. per square foot, it is advisable to take a higher factor.

If the wind-pressure on a square chimney be taken as 1,
that on an hexagonal chimney may be taken as 0·75,
" octagonal " " 0·65,
" circular " " ·5.

*Wrought-iron Chimneys.* — Wrought-iron shafts have found great favour in America and Russia, but in England and the Continent generally, as far as we have been able to ascertain, they are an exception. In addition to the wrought-iron shafts detailed in this paper, we have been informed of the following:—Messrs. Witherow & Gordon, of Pittsburg, Pennsylvania, U.S.A., have since 1876 built upwards of thirty wrought-iron shafts, varying in height from 100 ft. to 190 ft., and from 5 ft. to 9 ft. in diameter. The firm write us that these shafts answer admirably the purpose for which they were built. Mr. L. S. Bent, Superintendent of the Pennsylvania Steel Company, Steelton, Pennsylvania, U.S.A., states that his company have the following eight wrought-iron shafts in use, and have found them both durable and economical:—

| | | | |
|---|---|---|---|
| No. 1, | 170 ft. high, | 6 ft. 6 in. diameter, | built 1881. |
| No. 1, | 165 " | 6 ft. 6 in. " | 1877. |
| No. 1, | 135 " | 7 ft. 0 in. " | 1880. |
| No. 1, | 112 " | 6 ft. 0 in. " | 1881. |
| No. 4, | 110 " | 7 ft. 0 in. " | 1869, 74 5-6. |

They are lined for 30 ft. with 9-in. firebrick, and the remainder of height with 4-in. red brick. The Ravensdale Iron-works Chimney-shaft, Tunstall (Messrs. Robert Heath & Sons), is a circular wrought-iron shaft, not spread at its base. Its height from ground-line to top is 75 ft.; outside measurement at ground surface, diameter 6 ft.; ditto at top, diameter 6 ft. Seventy-five wrought-iron plates were used in the construction of this shaft, the thickness being ¼ in. The plates have a lap of 2½ in., and are riveted together with ⅝-in. cup-headed rivets. The shaft is lined its entire height with firebrick. The shaft carries off the fumes from three boilers. The wrought-iron chimney of Messrs. Francis & Co., of The Nine Elms Cement Works, Cliffe Creek, Rochester, was erected in 1878. It was designed by Mr. V. de Michelle, C.E., and constructed by Messrs. Fielding & Platt, Gloucester. The shaft is circular, and parallel throughout, and is constructed of wrought-iron plates. The plates vary in thickness downwards from ¼ in. to ⅜ in. Its height from ground-level to top is 160 ft.; external diameter throughout, 5 ft.; internal diameter throughout, 4 ft. 6 in. It is lined with 3 in. firebrick its entire height. The chimney is stayed against the wind by four 3¾ in. steel guy ropes. This chimney was erected over the centre one of a row of nine cement kilns, which are all connected to shaft by a wrought-iron horizontal flue 4 ft. in diameter. Two additional ones have since been added, and the chimney now carries off the gases from eleven cement kilns. Round the outside of centre kiln on ground level is fixed a cast-iron curb or base-plate. On this base stand four cast-iron standards or supports having their lower ends butting on to and secured to base-plate. The standards incline inwards until their upper ends meet to support a cast-iron circular chimney-base which forms the top of the centre kiln. The wrought-iron chimney proper commences from top of this circular cast-iron base, directly over which the 4 ft. horizontal flue is connected to shaft. For the construction of this chimney a timber stage was erected at the level of the kiln tops, and upon this stood the rivet fires. Four winches were worked on this stage, and to them were led guy-ropes, after passing round blocks at convenient distances. A hydraulic press, with a 4-ft. stroke, was then fixed over the centre kiln, and the top length of 20 ft., which had previously been riveted-up on the ground, and raised to the stage level, was placed upon the ram. The ram was then pumped up, and the 20-ft. length raised a height of 4 ft., the guy-ropes being slackened out to the required extent, as the 20 ft. length gradually rose. A 4-ft. ring of plating was then riveted on with ⅝-in. snap-head rivets and the usual lap, the ram was then again pumped up, and the now 24-ft. length raised the necessary height; another ring of plates was then riveted on, and the operation repeated, until the chimney had reached its required altitude. The cost of this chimney was about 1,000*l.*, including long wrought-iron flues.

*Messrs. Wesenfield & Co.'s Chimney, Chemical Factory, Barmen, Prussia.*—This has a square brick pedestal and an octagonal brick shaft. Its total height from foundation to top is 345 ft.; height from ground line to top, 331 ft. The pedestal is 20 ft. sq. by 40 ft. high by 7 bricks (equal to 5 ft. 3 in.) thick. The octagonal shaft is 291 ft. high, 17 ft. outside diameter at the base by 5 bricks (equal to 3 ft. 9 in.) thick; 11 ft. outside diameter at the top by 2 bricks (equal to 1 ft. 6 in.) thick. The shaft diminishes 2½ in. every 10 ft. in height, or 1 in 48. The internal octagonal clearance is 8 ft. throughout. The foundation is on a bed of hard and coarse gravel, and made of large flat quarry stones bedded with "terrass" mortar in the proportions of 1 lime, 1 river sand, and 1 "terrass" (a kind of pozzuolana). The pressure on the lowest part of chimney proper is equal to 21,335 lb., or 9½ tons, per square foot. The pedestal and shaft were built with bricks and ordinary mortar, composed of 1 of lime to 2 of river sand, prepared every morning by the masons themselves. On rainy days cement mortar was used in the proportion of 1 cement to 2 river sand. The courses of brickwork were flushed up with cement as construction proceeded. The crown of the shaft was built with cement exclusively. The foundation and pedestal were built in the summer of 1867, and the construction of the chimney was successfully completed in October of the same year. According to the original design it was intended to build to a height of 260 ft., but, as the erec-

* We are asked to state that the authors intend to extend the paper considerably for separate publication, accompanied by illustrations, tables, &c., so as to make it useful as a work for reference.

† Printed in the *Builder* for that year, pp. 461, 490.

* This is precisely what we pointed out ought to have been done in the case of the Bradford chimney accident (*Builder*, vol. xliv., p. 163).

tion was proceeding in a very satisfactory manner, it was considered safe to increase the height without altering the dimensions of the base. But before doing so, a comparison was made between the pressure on the foundations of this chimney and the pressure on the foundations of a chimney erected at Bochum, Prussia. These were found to be as follow :—

| | Lowest part of chimney proper. Press. per sq. ft. | Press. per sq in. |
|---|---|---|
| Chimney at Barmen, Prussia | 21,335 lb. | 149 lb. |
| Chimney at Bochum, Prussia | 18,429 lb. | 128 lb. |
| Excess of pressure on Barmen chimney foundation | 2,906 lb. | 21 lb. |

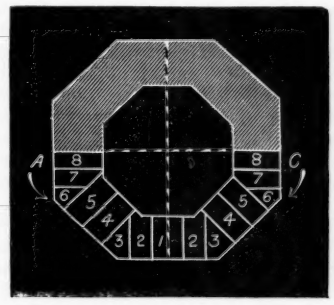
The three masons who constructed the chimney daily changed their positions, so as to equalise any unevenness in their respective laying. Every fifty feet a course of brickwork was painted *black* so as to indicate the height of any point of the chimney above ground. The chimney was built from the inside. The materials were hoisted by a steam engine erected temporarily near the place of construction. The frame which supported the upper drum over which the chain worked was moved higher after the completion of every three or four courses, and was at the same time turned horizontally, from one side of the octagon to the next one, so as to equalise the pressure of the frame on the masonry. The holes made into the masonry to support the frame were filled up with bricks and mortar immediately after the removal of the frame to a higher level. The chimney when completed (Oct., 1867) was vertical. In the spring of 1868, remarkable for storms and long-continued gales, this stalk inclined towards the north-east by the action of the south-west wind, probably aided by the softness of the mortar and the large size and shape of the ornamented chimney crown, which caught the wind and acted as on a long lever. The deflection was considerable at the end of May, and apparently increased. As before mentioned, layers of bricks in the shaft at distances of fifty feet from each other were painted black. The height of these black lines above the pedestal being known they were, by means of a theodolite, projected on a board which was fixed on the pedestal, and these projections showed that at

| | | | | | | |
|---|---|---|---|---|---|---|
| 251 ft. | high | the | chimney | was | out of plumb | 45 inches. |
| 210 | ,, | ,, | ,, | ,, | 30 | ,, |
| 160 | ,, | ,, | ,, | ,, | 16 | ,, |
| 110 | ,, | ,, | ,, | ,, | 5 | ,, |

The pedestal stood perpendicular. As the canting of the shaft was still increasing, immediate action had to be taken. The ordinary method of straightening chimneys was at first resorted to. A hole was made through the whole thickness of the masonry on the side of the chimney which required lowering, at a distance of 4 ft. above the top of the pedestal; into this hole a saw was passed and an attempt was made to cut through one half of the shaft, but owing to the thickness of the wall and the hardness of the bricks the saw could only be worked from one end, and the effect of sawing after two hours' work was almost *nil*. The hole through the stalk having been made with little trouble, and the difficulty experienced in sawing, led to the idea of removing a course of bricks and replacing it by a thinner one. Before the work was proceeded with an experiment, was made on an old inclined shaft 120 ft. high. This proving successful, it was determined to treat the new chimney in the same way. A layer of bricks was broken out by means of pointed cast steel bars, varying from 1 ft. 6 in. to 5 ft. in length. The diagram shows a horizontal section of this layer; the numbers 1, 2, 3, 4, &c., indicate the order in which the brickwork was removed. When Division 1 was broken out it was replaced by thinner bricks covered with "terrass" mortar. After this the two divisions marked 2 were broken out and replaced by thinner bricks; then the two divisions marked 3, and so on until one half of the whole course had been exchanged. Purposely-made flat shovels with long handles were used to lay the bricks which had to be placed near the inside of the chimney. A side space of 5 in. was left between the newly-laid bricks and the old ones of the next division, so as to enable the workmen to break out the latter with greater facility. The width of each single division was 2 ft. to 2 ft. 6 in. The masonry directly above was sufficiently dry not to give way when a course of that width was removed from below it. The replaced bricks were thicker near the points A and C, so that the difference was greater in the middle and gradually less towards the extremities A and C. As soon as the slit reached these points the chimney began to move, and by slight oscillations slowly settled down on the new layer of bricks. The time occupied in settling by oscillation at each substituted course varied from 18 to 36 hours, according to the width of the slits, which were different in the various cuts performed. The oscillations were greater the higher the cut. At the highest cut, 100 ft. from the top, the oscillations frightened the masons, and they left the place. The slit became alternately wider and narrower by $\frac{3}{4}$ in. This seems to prove the elasticity of the structure. Four cuts were made,—

| | | | |
|---|---|---|---|
| 1st | 4 | ft. above pedestal, greatest width | $\frac{3}{4}$. |
| 2nd | 100 | ,, ,, | $1\frac{1}{4}$. |
| 3rd | 140 | ,, ,, | $1\frac{1}{2}$. |
| 4th | 191 | ,, ,, | $1\frac{3}{4}$. |

After the completion of this work the chimney continued during several weeks to settle slightly in the direction opposite to its former inclination. This circumstance had to be carefully considered beforehand, or else the slits would have been made too wide, and so have produced an inclination in the opposite direction. A severe storm on the 6th and 7th of December, 1868, which overthrew several chimneys in the neighbourhood, did not affect this one. The result




of the straightening operation described above was quite satisfactory. The heights of the upper cuts were reached as follows:—Standing on a platform, the masons made a number of holes into the exterior wall of the chimney, 4 ft. above the platform on which they stood. Into these holes the ends of iron bars were fixed, and boards secured to them, so as to form another platform. Standing then on the latter, they fixed another platform, 4 ft. higher, in the same way. Every second platform was removed, so that the remaining ones were 8 ft. apart; they were then joined by ladders for the workmen to ascend. This method of straightening is only practicable when the chimney has a considerable diameter, and when the mortar is sufficiently dry as not to give way under pressure of the bars and platforms.

*Chimney at Duisburg.*—In December, 1868, a chimney was straightened at this place by the method just described, but as the diameter was not so great as that at Barmen, and as the mortar was soft, a wooden scaffold was erected round the shaft to reach the upper points which required cutting. The breaking-out and replacing of bricks could not be done in divisions wider than 5 in. to 10 in., as the upper masonry, not being dry, would have settled down. When the chimney was straight a further settling down towards the side of the cuts was prevented by driving iron wedges, covered with mortar, into the slits.

Mr. Bancroft then went rather fully into the details of the melancholy and discreditable chimney accident at Bradford; but all the particulars of this were so fully summed up and commented on in our columns at the time (vol. xliv., p. 163, Feb. 10, 1883), that it is hardly necessary to print a recapitulation of the subject here. Mr. Bancroft proceeded to give the following particulars in regard to the

*Edinburgh Gas Works Chimney.*—This chimney was designed by Mr. Mark Taylor, engineer to the company. Messrs. Geo. Buchanan, C.E., and Prof. Gordon, of Glasgow, were consulted. The builders were, for the stonework, Mr. James Gowan, of Edinburgh, and for the brickwork, Mr. James Bow, of Pollokshields, near Glasgow. The pedestal is square and of stone, surmounted by a circular brick shaft. Its dimensions are :—

| | |
|---|---|
| Stone foundation under ground | 6½ ft. |
| Part of base | 6 |
| Stone pedestal above | 65 |
| Brick shaft | 264 |
| Total height from foundation to top | 341½ |
| Height from ground-line to top, | 329 ft. |

The foundation stone is 40 ft. 6 in. square by 6 ft. 6 in. deep. The pressure on the bottom of foundation per square foot is nearly 2½ tons. The stone pedestal is 30 ft. square at ground line and 27ft. 9 in. square at top. The internal diameter of the pedestal is 22 ft. 6 in. at bottom and 20 ft. 4 in. at top. This was built during one summer, at the end of which the works were suspended until the following year. The brickwork of the shaft was commenced and finished in the summer following the erection of the pedestal. The following dimensions relate to the outer brick shaft (circular) :—

| | | | |
|---|---|---|---|
| Outside diameter at bottom | | | 26 ft. 3 in. |
| Internal | ,, | ,, | 20 ft. 5 in. |
| Outside | ,, | at top | 15 ft. |
| Internal | ,, | ,, | 12 ft. |

This was built up in five steps as follows :—

| | | | |
|---|---|---|---|
| 1st | section, 35 ft. | high, | 3½ b. |
| 2nd | ,, 40 ft. | ,, | 3 ,, |
| 3rd | ,, 48 ft. | ,, | 2½ ,, |
| 4th | ,, 58 ft. | ,, | 2 ,, |
| 5th | ,, 83 ft. | ,, | 1½ ,, |
| 264 ft. total. | | | |

The greatest pressure on any part of the work comes at the lowest section, where it amounts to about 8 tons 2 cwt. per square foot. The inner brick-shaft (circular) is distinct from the outer shaft, and is 90 ft. high, with 13 ft. internal diameter throughout, and was built in four steps, viz. :—

| | | | | |
|---|---|---|---|---|
| 1st | section, 14 ft. | high, | 35 | in. thick. |
| 2nd | ,, 6 ft. | ,, | 30 | ,, |
| 3rd | ,, 30 ft. | ,, | 25 | ,, |
| 4th | ,, 40 ft. | ,, | 20 | ,, |
| 90 total. | | | | |

The thicknesses include a lining of fire brick 10 in. thick for 20 ft., and 5 in. thick for the remaining 70 ft. The weight of the materials used is about 3,700 tons. The total cost was 4,637*l*. The lightning-conductor is a solid copper rod ⅝ in. diameter. The stones used in the foundation are Cragleith, Humbie, and Hailes, which before use were tested by Mr. Buchanan and Mr. James Gowan. The tests were made in the most careful way by crushing-cubes of 1 in. square. The following were the results of tests :—

| | | | |
|---|---|---|---|
| Cragleith | crushed at | 315 | tons per square foot. |
| Humbie | ,, | 240 | ,, |
| Hailes | ,, | 225 | ,, |

A second test of Cragleith showed that before being crushed to powder it sustained a pressure of 440 tons per square foot. The appearance after fracture of the different cubes was that of a pyramid or wedge, and this led Mr. Gowan to assert that if the cubes were enlarged a greater relative increase of strength would be gained, and further that if the pressure were *vertical* to the line of cleavage a greater resistance would be obtained, so that such a stone as Hailes, which is a laminated stone, would increase in strength according to its surface more in proportion than that of a rock-stone such as Cragleith. This led to discussion and further tests, the result being that with a 4 in. cube from Hailes quarry the resistance was equal to 567 tons per square foot. The bricks were supplied by Mr. Livingstone, of Portobello Brickworks, and were tested with the following results :—

| Description of Specimen. | Length. | Breadth. | Thickness. | Weight. | Crushing weight on each brick. | Crushing weight per sq. ft. |
|---|---|---|---|---|---|---|
| | in. | in. | in. | lb. | tons. | tons. |
| Extra size and quality | 10 | 5 | 3 | 10¼ | 153 | 440 |
| ,, ,, | 9½ | 4¼ | 2¾ | 9 5/16 | 140 | 448 |

*Repairs of Chimney-shafts.*—In the *Builder* for January 8th, 1876, there is an interesting account of the repairing of chimney-shafts damaged during the Siege of Paris by the fire of the German artillery.

After the reading of the paper by Mr. F. J. Bancroft, the numerous drawings and diagrams not included in the foregoing descriptions, were, at the request of the president, explained by Mr. R. M. Bancroft, who called attention to the construction of chimney-caps, the mode of

building cavity chimneys, and a novel design by Mr. Holroyd Smith, of Halifax,—a sort of missing-link between brick and wrought-iron, being, in fact, a vertical shaft of brickwork trussed with wrought-iron rods. Several photographs were also shown to the members, depicting the Steeple Jacks at work repairing shafts and church-steeples, and fixing lightning-conductors.

A vote of thanks to the authors having been unanimously passed, the meeting adjourned.

## SOME ART NOTES IN THE MUSÉE PLANTIN.

The many drawings and fine engravings exhibited in the Musée Plantin-Moretus form an admirable complement to the painted works of great and small masters, which one sees in the museum or churches of Antwerp.

The story of Christopher Plantin and Jean Moretus, his good apprentice, is more or less legible in "Baedeker," and is deciphered, no doubt, by all travellers in Belgium; that wild ocean-child who wantonly comes from Harwich; the weak hydrophobist going deviously over by Calais. The mere story is not to detain me here. From the excellent catalogue of Max Rooses I wish only to select some few matters of interest.

If any one is ignorant of Low Country art it is not for the want of accessible information. He has Sir Joshua Reynolds for a guide, and Descamps; he may read the enormous "Catalogue raisonné" of Smith, the random notes of Lord Gower, the dallying critique of *dilettante* Fromentin, or the dismal analyses of Crowe. From all these authorities he will learn, and quite slight observation will enforce the lesson, that Flemish painting of the time between Quentin Matsys and Rubens wants interest and sterling value. After Rubens, again, was a swift decline. The Musée Plantin abounds in examples of a meretricious art.

Adam van Noort was a precursor of Rubens, who shared with Otto Vœnius the distinction of being his master. We are told by Professor Springer, and allowed by Mr. Crowe to believe, that no works of this painter are preserved. As many as fourteen of his drawings, however, are in this museum, and there is one in the collection at Rotterdam. In the absence of any more important performance, his drawings must be allowed to be interesting, though in view of the statement that Van Noort was "a thorough master of his art," they certainly seem to be poor.

Of greater value, as bearing, one would say, directly upon the study of Rubens, and yet more, of Vandyck, are the many designs of Martin de Vos. The art of Italy was assimilated slowly, and but partially, by the diligent, uncouth Fleming. A better man than his master, Frans Floris, Martin de Vos came nearer than he to an effective blending of the Italian with the Flemish ideal. In drawings he is seen at his best. In these the Italian love of space and balanced composition is strongly felt. We think of Perugino, of the stupendous simplicity of Fra Angelico, of the distinguished groups of Raffaelle. In view of some great human maelström by Rubens one often is tempted to wish that the Society for the Preservation of Open Spaces had had an earlier existence, and had extended its operations to art. Vandyck, so reserved in manner, so strong in feeling, has not this fault. The drawings of De Vos, in their simplicity and direct pathos, remind me of him. The great pictures in the Antwerp Museum have hardly the interest and none of the charm of these skilful swift compositions.

Hubert Goltzius was another precursor of Rubens, who was studied to some purpose by the great painter. Amongst the archives of the family a deed is preserved by which Rubens makes over to Plantin, for 4,920 florins, no less than 328 "examples of the works" of this artist. From this transaction there might be some moral deduced. Perhaps the worthlessness of Goltzius was not fully revealed to Rubens till suddenly in some strait he bethought him how saleable not the less were his works.

Rubens himself was variously employed by the firm between the years 1610 and 1625, and received for his work in that time 1,103 florins. The Plantin Museum boasts fourteen portraits from his brush. Of these there is little to say. His splendid supremacy in this department of art is not strengthened by any of these effigies of his friends and employers. The portrait of Justus Lipsius is interesting, of course. Another of Jeanne Riviere is exceedingly fine. There is no drawing by Rubens of remarkable interest. The great ledger shows that he designed (and was paid for) some twenty-five frontispieces, and a large number of these are exhibited. One slight drawing of Samson taking Honey from the Mouth of the dead Lion we shall meet again when we follow Max Rooses upstairs to the "Salle des Cuivres."

Though I may not, I would have my reader linger in the rooms which show old Christian missals and manuscripts of nameless worth, and early printed books of inexpressive *luxe*. In this sacred vicinage there is no solace but in the wisdom of Antoninus,—"Cast away the desire after books that thou mayest not die murmuring."

The principal attraction, in regard to art especially, of the rooms on the upper floors is the great collection of engravings of the Flemish School, the interest of which is heightened by the circumstance that in a vast number of cases the impression and the plate or block upon which it is taken are exhibited side by side. Before passing to some notice of these, I may call attention to some effective water-colour drawings by a Dutch painter, Jacques de Wit. These have an interest beyond their excellence as being copies of the designs executed by Rubens and his pupils in the Church of the Jesuits at Antwerp. The church was burned down in 1718, and no record, save only some sketches, remains of all that work but the drawings of De Wit, which preserve the memory of 36 out of the original 39 compositions.

In the "Galerie des Cuivres," which contains amongst many things a set of the "Passion" of Lucas Van Leyden, I pause only to mention a fine etching by Ferdinand Bol of "Luna in her Car." There is no influence of Rembrandt in this. It is, indeed, a marvel how an artist who, in the first instance, followed his master so closely, should in the end have been able to liberate himself so entirely.

The longest halt will be made in the rooms numbered 22 and 23; the former given up to engravings after Rubens, Vandyck, and Jordaens, the latter to the engravers of Antwerp. None of these categories, it should be observed, are exclusive. The room we have passed,—the great "Salle des Cuivres,"—is full of the works of engravers we now meet with again. Naturally, also, the engravings after Rubens and his school are often *chefs-d'œuvre* of the engravers of Antwerp.

The unspent force of a great creative painter is sufficient, it seems, to give life to a strong following of reproductive engravers. For Raffaelle, there was Marc Antonio; for Sir Joshua Reynolds, the mezzotint masters. Certainly Rubens was not less fortunate than these. Thirty-five splendid engravings by the Bolswerts, Paul Pontius, Peter Jode, Luke Vosterman, and others, do all that mere ink could do (*pace* Herr Unger) for the fame of so glorious a master of colour. To the student of art in Antwerp it is much to have here side by side such good reproductions of paintings which he would have to scour all Europe to see; and they are not here alone. The same engravers have done their very best for the promising pupil, Jordaens. Vandyck, beneath the faithful burin, is little marred. A masterpiece of brilliant engraving is that by Pierre de Jode of the Three Graces of Rubens; that again of his Massacre of the Innocents, by Paul Pontius; and that, especially, after Vandyck, by Cornelius Vermeulen, "Portrait of Marie Louise de Taxis."

The engravers associated with the Italianised art of Flanders were all artists of Antwerp. The Sadelers, John, Egidius, Joseph, Raffaelle, and some more; the brothers Wiericx or Wierx, John, Jerome, Hieronymus, and Anthony; John, Cornelius, and Theodore Galle; Jerome Cock, who would surely be related to these; these names, with one more,—the versatile Crispin van den Passe,—rise at once (as they say) to our minds.

In some distant time of headlong youth, when to collect old prints seemed not vanity, I have seen and reverently handled choice prints of these masters, hallowed by the admired sign-manual of P. Mariette. Sharp and true was the burin of a Wierx; Crispin van den Passe could be all things to all men; Raffaelle Sadeler has a dainty grace. Hardly in any time of art has the engraver's work been better done than by those little masters of Antwerp. They had not under their hands the great task of the "little" Germans, the graphic portrayal of discovered truth and recovered culture, but they did that which was given them to do and did it with their might. The good Christopher Plantin and his family enjoyed a grateful monopoly in the publication of liturgical works. His faithful engravers lent their aid to moribund Popery: so they gave less than its meed to the world, and great length of days to Martin de Vos. Many not much in sympathy with the *motif* of that art will linger admiringly over these brilliant engravings of its masters.

David Teniers, because of his cosmopolitan fame, is less closely associated with Antwerp than the brothers Wierx. The careful Max Rooses, however, will not let us forget that here was his domicile of origin. Teniers, the elder, is represented by two etchings. The younger, great David's greater son, has four. These etchings of the Teniers, father and son, have always seemed to me to be bad; not comparable, to take only one instance, with those of Ostade, but odious comparisons do not come into my plan.

An excellent etching of St. Catherine by Rubens will not be left unnoticed. Our catalogue says that probably there is no other from his hand. This is a matter I know nothing about, and am all at the mercy of Max Rooses, than whom no one knows more. In taking my last leave of Rubens I may mention that there is here, in this *salle des graveurs anversois*, a print after Rubens by Schelte, *a* Bolswert, of the "Miraculous Draught of Fishes." It is a fine engraving and remarkable insomuch as the engraver has made important additions to the picture as one sees it in the Church of Notre Dame at Malines. Out of pure compassion, we may suppose, he has supplied a bow oar to the sacred craft, which is cruelly over-loaded in the original; and upon the other side of the picture has added two more to the number of those who are hauling the net. Certainly in point of mere numbers the disciples were well repaid for their toiling all night, though it is hard to imagine a vicinage so destitute as to be willing to eat any fish in that seine. The Galilean idea of a "few small fishes," if Rubens may be taken for a guide, must have differed not a little from our own. These additions upon either side give to the print the oblong shape which the picture only has when seen in conjunction with its two wings (separate subjects representing upon one side St. Peter taking his tribute money from the fish, on the other Tobit and the angel).

Vandyck is here too in what many will call his glory, in his etchings to wit of the Breughels, Peter and John, of Adam van Noort, who (*v. sup.*) gave Rubens to the world, of Erasmus and Sustermans, and others.

These are but the stray notes of a passing visitor. They may serve to suggest to those who know not the place that there is there some matter of interest, in regard to which I have simply recorded, whilst yet they are fresh, the impressions received by my mind.

Ernest Radford.

## INSTITUTION OF CIVIL ENGINEERS.

### ANNUAL MEETING AND ANNUAL REPORT.

The Council of the Institution of Civil Engineers, and the corporation itself, are to be congratulated on the plain straightforward report laid before the annual meeting on the 18th of December (see p. 841, *ante*), on the steady progress of the Institution, and on the facilities it affords, not only to its own members, but to those of five other independent engineering associations, for professional intercourse and instruction. The noble theatre of the institution, which is probably the room best adapted for the purpose of audition and speaking in London, has been gratuitously placed at the service of the Meteorological Society, the Telegraph Engineers, the Iron and Steel Institute, the Gas Institute, and the Society of Chemical Industry. Thus a point of rallying is afforded for the different cognate branches of a most important profession, the advantage of which is great, and may hereafter prove to be still greater. When to this advantage of a hall of meeting is added that of the fine library of the Institution, now containing 19,000 volumes, and increasing at the rate of 800 volumes a year,

while the Proceedings of the Institution, now forming four stout octavo volumes in the year, amount to seventy-four volumes to date, it will be seen that the Institution is on the high road to be regarded more in the light of an engineering university, or, at all events, faculty, than as a purely voluntary association. Thus with regard to the admission of students, "the Council have of late years required candidates to furnish some account of their scholastic career, and generally to afford information as to their fitness." Thus a certificate of some recognised engineering school may soon be expected. There are now 722 students on the books, as against 707 at the corresponding period of last year.

Exclusive of the students, the corporate members of the society, including honorary members (20 in number), members, associate-members, and associates, amount to the number of 3,558, being an addition of 203, or 6 per cent., to the number on the roll at the close of 1882. The receipts for the year were 18,541*l.*, including interest on the sum of 57,892*l.*, invested by the corporation. The expenditure was 17,431*l.*, of which the large share of 5,768*l.* has been expended in the preparation and publication of volumes 71, 72, 73, and 74 of the Minutes of Proceedings. The care with which these volumes are prepared and edited, the numerous and accurate drawings and diagrams with which they are illustrated, and the abstracts which they give of engineering publications in France, Belgium, Austria, Germany, and Italy, are such as to render the volumes issued at so serious a cost a source of professional information of the highest value.

The year's expenditure on the library is 381*l.* The sum of 460*l.* is expended in prizes and premiums for contributions of a literary character, besides 66*l.* spent on medals and diplomas. For the annual dinner, which may compete in importance with any banquet of the sort held in London, only 216*l.* is charged to the Institution, so that the office of president must, in this respect, involve a considerable personal outlay.

In the last year the new feature of lectures on special engineering subjects was introduced; and six lectures, on the practical applications of electricity, were given by as many lecturers on the alternate Thursdays from February 15th to May 3rd. A second course of six lectures, two of which have been already delivered, has been arranged for the present session, the subject being "Heat in its Mechanical Application." These lectures will be printed, and issued to the members. The Council are to be congratulated on "having faithfully discharged the trust committed to their care by the corporation."

## EDINBURGH.

THE new church for the rapidly-increasing suburb of Merchiston, the progress of which was duly referred to by us, was formally opened on the 28th ultimo. It is a handsome edifice, designed by Mr. John Honeyman, of Glasgow, in the Early English style, at a cost of about 15,000*l.*, and consists of a nave with aisles, transepts, and quasi-chancel, having attached thereto a hall, beadle's residence, &c. The church, which measures 130 ft. by 62 ft. 6 in., and 70 ft. high to the ridge, will accommodate a congregation of 1,000. At the north-west angle there is a tower, rising to the height of 130 ft., which is, in the meantime, capped by a low, slated roof, but which it is proposed to surmount by a brooch spire. At the base of this tower is placed the principal entrance, which is deeply moulded and richly decorated with the dog-tooth and other ornaments of the period. The east end is lighted by three lofty lancets, beneath which is a blank arcade with dog-tooth enrichment. The interior presents the aspect more of an episcopal church than of what we are usually accustomed to associate with the Presbyterian form of worship. The pillars which support the clearstory are cylindrical, with moulded caps, and the arches are also richly moulded. The north transept is reserved for the organ, and rises into the clear-story so as to allow the free access of sound from the instrument. The pulpit is placed against the western pier of this transept, and at the opposite side is placed a reading-desk. Against the east wall, under the triple lancet, there is a reredos with illuminated panels containing the Creed and Lord's Prayer. The pulpit and reading-desk are formed of walnut, and are adorned with paintings upon a gold background of the fruits mentioned in the Bible. The hall, Sunday-school, and other accessories at the west end are designed so as to form an effective group, and, from the position which it occupies, the church forms an important object in the approach to the city from the south-west.

The subscriptions for a testimonial to the Duke of Buccleuch have reached the sum of 8,000*l.*, but it is expected that the sum of 10,000*l.* will ultimately be obtained. At a meeting of the subscribers, held on the 28th ult., it was resolved that the best mode of disposing of the fund would be the erection of a statue or monument in Edinburgh, as the capital of Scotland, on the most convenient and best site to be obtained. Objection was taken to the word "statue" in the resolution, it being maintained that the city was already over-weighted with statues, not of very high artistic merit. To those in the secret this objection is of considerable weight, seeing that, if a statue is to be the outcome of the proceedings, it is a foregone conclusion who the sculptor will be. Two sites were mentioned as suitable for the proposed memorial,—one to the west of St. Giles's Cathedral, and the other in the Princes-street-gardens. To both of these sites there are manifest objections; that to the west of St. Giles's has been claimed, and is a more appropriate place, for the contemplated statue of John Knox; and the site in Princes-street is much too conspicuous and important to be appropriated to a memorial of the kind; it should be reserved for a monument of equal importance to the Scott monument. If we might venture to offer a suggestion, it appears to us that it is a mistake to crowd all public monuments in the New Town. There are many eligible sites in the Old Town where such would appear to great advantage. A group of statuary in Nicholson-square, or an arch at the entrance to the Meadow-walk at Forrest-road (both in the proximity of Buccleuch-place), would be appropriate. If the first were resolved upon, the memorial would gain and not lose in dignity by the fact that the square is not of large dimensions, and it is likewise a conspicuous position in the main line of traffic southward. Then, again, Edinburgh does not possess a single triumphal arch. One upon the site indicated at the south end of Forrest-road, with the Royal Infirmary on one side and the Medical College at the other, and having a background of foliage formed by the avenue of the Meadow-walk, could hardly fail to prove effective.

The church in Bread-street, vacated by the United Presbyterian congregation, which migrated to a more fashionable neighbourhood at Viewforth, has been acquired by the West Church parish, and formed into an auxiliary place of worship, under the designation of St. Aidan's. The interior has been overhauled and decorated, and it now presents a much more cheerful aspect than before. The United Presbyterian Church in Arthur-street, one of those ugly Puritanical places of worship at one time considered the proper thing by Nonconformists, has been overhauled and rearranged from plans prepared by Mr. David Robertson, architect. The square-headed windows have been converted into double round-headed windows, with Norman detail, and the galleries, &c., in the interior have been altered to match. Additions have been erected in the rear of the church, containing a hall, vestry, &c.

The Gillespie School, a large edifice in the Batty Langley style of Gothic, erected about a century ago, has proved inadequate to the requirements, and an addition is to be erected thereto at a cost of 1,500*l.*

The dome of the Bank of Scotland has for some time been undergoing repairs, under the directions of Messrs. Kinnear & Peddie, the oak timber used in building the lantern having been found to be in a state of decay. Messrs. Kinnear & Peddie have taken advantage of this circumstance to effect an improvement upon the design of the lantern. The lines of the dome proper are not very happy, and the lantern sat upon it in a very unsatisfactory manner, having been corbelled out from the apex so as somewhat to suggest the idea of a spinning-top. The narrow neck has now been spread out, and at each angle of the octagon scrolls have been added which unite the two members in a more satisfactory manner than before. The groups of statuary designed by Mr. Bryce to surmount the piers of the loggia still remain unexecuted.

## ST. MARY'S CHURCH, PADDINGTON.

"Pitt is to Addington
As London is to Paddington."—CANNING.

HAVING determined to improve, plant, and re-open their disused burial-ground for public resort, the Paddington Vestry request the owners of vaults and graves to place the monuments and gravestones in a proper condition of repair. Of the antiquity of this locality there can be no question. The village could boast of its own place of worship as long ago as the beginning of the thirteenth century. That was, in all probability, "the old and ruinous church," which, taken down in 1678, is supposed, from its painted window, to have been dedicated to St. Katharine. It was replaced by St. James's, built by Sir Joseph Sheldon and Daniel Sheldon, to whom Sheldon, bishop of the diocese, leased the manor. This church again,—being that in which, on the 23rd of March, 1729, Hogarth married Jane Thornhill,—was removed just a century since when St. Mary's, the new structure, was erected close by upon the Green from the then greatly admired designs of John Plaw. Once "finely embosomed in venerable elms," St. Mary's stood near the parish stocks, an ancient yew and a double-leaved elder flourishing in its churchyard. Many celebrated names occur in the register. The lists of interments in the graveyards comprise John Bushnell, who carved the four statues for Temple Bar; Vivares, John Hall, and Lewis Schiavonetti, engravers; George Barrett and William Collins, painters; Thomas Banks and Joseph Nollekens, sculptors. Mrs. Siddons, removed from No. 27, Upper Baker-street to her pretty cottage by Westbourne Farm, was buried here in 1831; and near to her grave is that of Haydon who, at his residence, No. 1, Burwood-place, Edgware-road, on the 22nd of July, 1846, terminated with his own hand the unhappy "forty-two years which he devoted to the improvement of the taste of the English people in high art." Nor should we neglect to mention Michael Bryan, author of the "Dictionary of Painters and Engravers," or Caleb Whitefoord, the Papyrius Cursor of the daily press, whose memory lies embalmed in Goldsmith's "Retaliation" and Wilkie's Letter of Introduction. Of the later churches, St. James's, at the southern end of the Grand Junction-road,* became the parish church in 1845. Connaught Chapel, now St. John's, in Southwick-crescent, was built in 1826; Holy Trinity, one of the most beautiful of our modern churches, in Bishop's-road, 1844-6;† whilst All Saints, in Cambridge-place (1847), occupies part of the site of the waterworks reservoir at the end of Star-street.

It is curious to read, in a work published barely sixty years ago, that Paddington had then less than 1,900 inhabitants, and possessed many rural retreats as retired as though they were many miles distant from the metropolis. The renown of the White Lion, dating from the year 1524, and the Wheatsheaf, a beloved haunt of Ben Jonson, both in the Edgware-road, is as dead as is that of the Red Lion by the Harrow-road, where Shakspeare is said to have played, or of the other Red Lion by the bridge, over the West Bourne, which is described in an inquisition of King Edward VI. Yet some may yet be living who can remember how Miles's pair-horse stage, at a 3s. fare, took more than three hours to reach Holborn-bars from the Green; the tedium of the journey relieved by his boy's tales and fiddling; or recall the water trip to Greenford-green and Uxbridge, with the pleasant drive out to Harrow by Westbourne-green, across the Bourne, and so by Green-lane through Kingsfield (Kensal) to Harlesden. Very little indeed remains in the last two mentioned localities of the scenes which George Morland drew. The making in 1801 of the basin and canal to join the Grand Junction Canal at Bull-bridge, Norwood, near Heston, succeeded and in a measure superseded by the Great Western Railway,‡ combined with the Waterworks of 1812, tended to destroy the attractions of the locality nearer town. The Saxon

* The foundation-stone of the new building was laid by H.R.H Princess Christian, 11th Feb., 1882. Oxford and Cambridge terraces perpetuate the benefactions of the Lady Margaret, Countess of Richmond, to those universities.

† In the Perpendicular style, by Thomas Cundy, architect, at a cost of 18,500*l.* The richly-crocketed spire rises from a pinnacled tower to a height of 219 ft. The crypt is level with the chimney-tops of Belgrave-square, 75 ft. above Trinity high-water mark at London Bridge.

‡ Opened to Maidenhead, 1838; to Twyford next year; and to Bristol, 1841.

Pædingas lay between the ancient British causeways now known as the Bayswater and Edgware roads and the West Bourne in its course from West End through Kilburn wells to the manor of Hyde. This stream, crossing the Edgware-road by Godwin the Hermit's Priory* and the Harrow-road at Nine Acres flowed westwards of the modern Gloucester-terrace (formerly Ranelagh-street) through Coalbrook-dale to the manor of Hyde. The Pædings' settlement seems to have been cleared from the vast northern forests soon after the Conquest, with pasture for the villagers' cattle and the woodfruits for their hogs. It is not mentioned in the Book of Domesday, and we should place slight trust in the charters of King Edgar professing to grant lands here to West Minster. Newcourt cites the grants in his "Repertorium," adding that they were confirmed by King Henry I. and his next two successors on the throne. The earliest authentic document is that of 31 Hen. III., whereby Richard and William of Paddington transfer their "tenement" to the Abbot and Monastery of Westminster. From the end of the thirteenth century all the temporalities, the rent of land, and the young of animals, being valued at 8*l.* 16s. 4d., were devoted to eleemosynary purposes. Tanner speaks of Paddington as a parish *temp.* Richard II., whilst, according to Henry VIII.'s Valor Ecclesiasticus, the rectory yielded, like to the manor, a separate revenue to the Minster; by the Subsidy Roll of that reign the population scarcely exceeded 100 souls. At the Dissolution both manor and rectory alike went to the endowment of the Westminster see; this abolished, King Edward VI. gave them to Ridley, bishop of London, and his successors for ever, they then being let for 41*l.* 6s. 8d., besides 20s. for the thirty acres of Paddington Wood. In King Charles II.'s reign the population numbered about 300; and during the following hundred years nearly the whole of Paddington had become grazing land, being upwards of 1,100 acres; on the bishop's estate, whence Bishop's-road, Blomfield-road, &c., were kept several hundred cows. For a long time the gallows and gibbet contributed to its charms in the eyes of the vulgar; and Connaught-terrace marks the site of a large number of wooden cottages which were built, *circa* 1790, for a colony of artificers. The actual site of Tyburn Tree, which stood at Deadly Never-green as early as Henry IV., is a moot point with topographers: some assign it to Connaught-place, others to No. 49, Connaught-square. In the wooden premises adjoining the house which stands over against the Dudley Arms, M. C. Wyatt modelled and cast the now dishonoured equestrian statue of the late Duke of Wellington. Westbourne-place, swept away by the railway, was built by Ware, and contained much material from old Chesterfield House, May Fair, which he was employed to rebuild for the celebrated earl of that title. Ware quitted the ignoble trade of a chimney-sweeper, and, studying architecture, became a man of science and taste, editing Palladio's works with various kindred publications.

In a Parliamentary grant, 1653, of the abbey and chapter lands, the common field at Paddington is set forth as situated "near to a place commonly called Baynard's Water." Again in 1720 that same common field is stated to be occupied by one Alexander Bond, of Bear's Watering, in the parish of Paddington. In this watering-place, and one, indeed, that from the earliest times had supplied Western London with water, we have to recognise the present Bayswater. Long noted for its springs and conduits, it still preserves the name of Bainardus, a follower of the Conqueror, and founder of Baynard's Castle by St. Paul's, who held land here of the Abbot of Westminster. Bayswater as part of Paddington parish calls for little remark, since it assumed its present aspect as recently as 1839—49, when the last of the original springs was covered in at Craven Hill, which takes its name from the following singular circumstances. Soon after the outbreak of the Great Plague, William, first Earl of Craven (of the older title), established on the east side of Carnaby-street a lazaretto of thirty-six small houses, with an adjoining cemetery known as the Pest Field,† for the afflicted inhabitants; some thousands of interments were made in the then cemetery in Marshall-street. When the ground became covered with houses, the third Lord Craven received (1722) in exchange a plot in Paddington, which he dedicated to similar uses. But the latter site in its turn rising in value, application was made to Parliament in 1845 to remove the field further away, and Craven Hill Gardens was built over the ground. In the Crace collection is a valuable freehand plan of the estate, dated 1779, which, when produced by the late Mr. Crace in the Court of Chancery some years since, is understood to have virtually settled the question at issue as to the ownership of the Craven Hill property.

* See the *Builder*, vol. xliv., p. 625, where, however, by an error in transcript, "Aye," was written for "West Bourne."

† At what is now the south-western corner of the junction of Marlborough and Poland streets.

## SHOP AND COTTAGE, SUTTON COLDFIELD, WARWICKSHIRE.

The illustration given in this week's issue is of a corner shop and warehouse intended for a basket-maker, with the house planned to be let distinctly.

The ground-floor will be built with red bricks; the upper with timber framing, filled in with brickwork, and rendered with plaster; the roofs covered with Broseley tiles.

The building is about to be erected for the Rev. W. K. Riland Bedford, Rector of Sutton Coldfield, from the designs of Mr. Thomas W. Cutler, F.R.I.B.A., 5, Queen-square, Bloomsbury.

## MISSION HALL, ST. FAITH'S, STOKE NEWINGTON.

The Mission-hall of St. Faith, Stoke Newington, was opened on Sunday, the 7th of October. A great want and hindrance was felt in the parish not having a room for school and mission purposes, as there is not a room to be hired in the neighbourhood, so it was determined to make a start in commencing the room, which is 63 ft. long by 33 ft. wide, with two large class-rooms under part of the room, which will be also used for a soup-kitchen in the winter. As it is erected by the side of St. Faith's Church, it was impossible to have windows except at one end, as there is only a narrow passage between them; so, therefore, to obtain more light, there are four sky-lights in the roof, which is an open-timbered one, as on two sides the room abuts against gardens to houses. The hall is built of yellow stock bricks, with Bath stone dressings; and the flat is covered with thick zinc, and the sides of the roof of the slates. As economy of cost was desirable a bell is erected in one of the chimney-stacks. The architect is Mr. J. Martin Brooks, 35, Wellington-street, Strand.

## GRAFTON HALL, CHESHIRE.

This Mediæval mansion and demesne belonged to the Massys of Grafton in the reign of Henry VIII. The house was rebuilt and greatly enlarged about the latter end of the sixteenth century, but had lately fallen very much to decay. For some years past the structure has been undergoing a complete restoration, from the designs and under the superintendance of Mr. Birch, architect, of John-street, Adelphi, London. Messrs. Laing were the builders, and Mr. W. Crockett the general foreman of works. The additions and alterations have been made entirely in the style and spirit of the old work. All the handsomely-carved and moulded old oak panelling peculiar to the work of this period has been carefully restored, and the Mediæval character of the Hall has been strictly preserved, and combined with modern ideas of comfort and convenience. The building is of red brick and stone dressings, covered with Westmoreland slates, and presents a façade broken up by boldly-projecting gables, with double, treble, and four light mullioned and transomed windows, of very fine proportions, flanked at each end by quaintly-fashioned towers. The original idea of the forecourt has been retained, and the old triumphal archway, with its Elizabethan carvings and adornments, has been carefully restored, and a perforated stone balustrade, with piers, carved finials, and escutcheons has been substituted for the old wall. The garden façade is effectively broken up by gables and embattled projections, commanding an extensive view of the surrounding country. The garden-entrance is placed in a recessed portion, which bears panel-stone and coat of arms, is embattled, and surmounted by a massive angular chimney-stack, giving much dignity and importance to this elevation. The principal staircase is executed in wainscot, with panelled and moulded dados and soffits. The large drawing-room is wainscoted to the ceiling, and the remaining finishings throughout the house have been executed in oak and pitch-pine.

## NEW BUILDINGS, MIDDLE TEMPLE.

Our illustration represents a block of chambers which have lately been rebuilt and are now completed. The block, measuring 121 ft. by 33 ft., is divided into two buildings, viz., No. 4 Brick-court and No. 5, Essex-court, each building containing two sets of chambers of four rooms each on a floor, making a total of twenty sets, with water-closet, lavatory, and laundress accommodation to each, and ample cellars on the basement.

The building is of red brick with Portland stone dressings. The staircases are lined with white glazed bricks, the steps and landings are of Penryn granite. The floors throughout are of Dennett's fireproof construction.

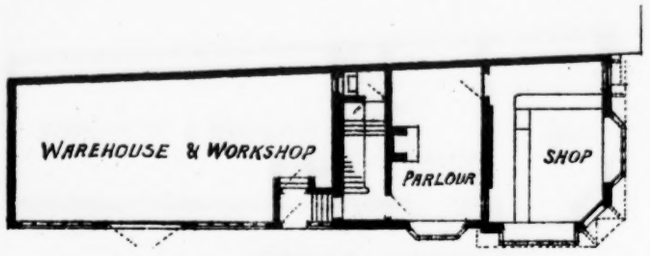
The works have been executed by Messrs. Patman & Fotheringham, of Theobald's-road, London; the carving by Mr. Earp. Mr. G. Goodchild acted as clerk of works.

The whole has been carried out from the designs and under the superintendence of Mr. J. P. St. Aubyn, architect to the Honourable Society of the Middle Temple.

## A WORKING MEN'S CLUB.

We give an illustration this week of the new premises of the "Nelson" Working Men's Club, Warwick, the cost of which has been generously defrayed by the firm of Messrs. Nelson, Dale, & Co., and which were opened a week or two since. The building is situated at the farther end of Wharf-street, and in close proximity to Emscote Mills. The accommodation provided includes entrance-hall, office, bar, and smoke-room, all on the ground floor. To the left of the hall is the staircase,—leading to a suite of billiard and other amusement rooms,—the reading-room, and the lavatory. Attached to the bar is the caretaker's cottage, consisting of a "living-room," two bedrooms, and a scullery. Under the greater portion of the building there is extensive cellarage. Off the entrance-hall is the large entertainment-room, 90 ft. by 30 ft.; 26 ft. in height to the collars of the roof, and 16 ft. to the wall-plate. This is intended to serve also as a dining-room for the workpeople at the Mills; and to meet that end a kitchen is attached, in which is fixed one of Grove's patent kitcheners. The entire building is supplied with Boyle's patent ventilators, and warmed throughout with hot water apparatus by Mountain & Co., of Birmingham. On the second floor is a large billiard-room, fitted with two tables, purchased from Messrs. Burroughes & Watts, of London. To the right and left of this compartment there are two other rooms. The roof is open-timbered, like that of the entertainment-room. The elevation is of bricks of the neighbourhood, with moulded brick architraves round the doors and windows of a darker tint. String-courses, cornices, and flowers of white and red bricks are here and there introduced. The window-heads and sills are of Bath stone, and the roofing is of red tile, with an ornamental ridge. No contractor was engaged, Mr. George Nelson himself undertaking that office, while the actual work of building has been carried out exclusively, and in a most commendable manner, by the *employés* of the firm, from plans prepared by Mr. F. H. Moore, architect, of Northgate-street, Warwick. The iron brackets were supplied by Messrs. Macfarlane & Co., of Glasgow, and the gas-fittings by the Warwick Gas Company.

**A Coloured Wood Pavement.**—A diachromatised wood pavement has just been completed at Pollokshields U. P. Church, Glasgow, by Messrs. Henry Chalk Webb & Co., Worcester, of which the Rev. Alexander Brown, the minister, writes "it has a fine effect and is very solid and comfortable for use." The special characteristic of the work consists in employing colour so as to saturate the wood throughout its thickness, instead of being a superficial application only, thus giving the colour some of the permanence of an inlay.




GROUND-FLOOR-PLAN.

10 5 0 10 20 30 40 50

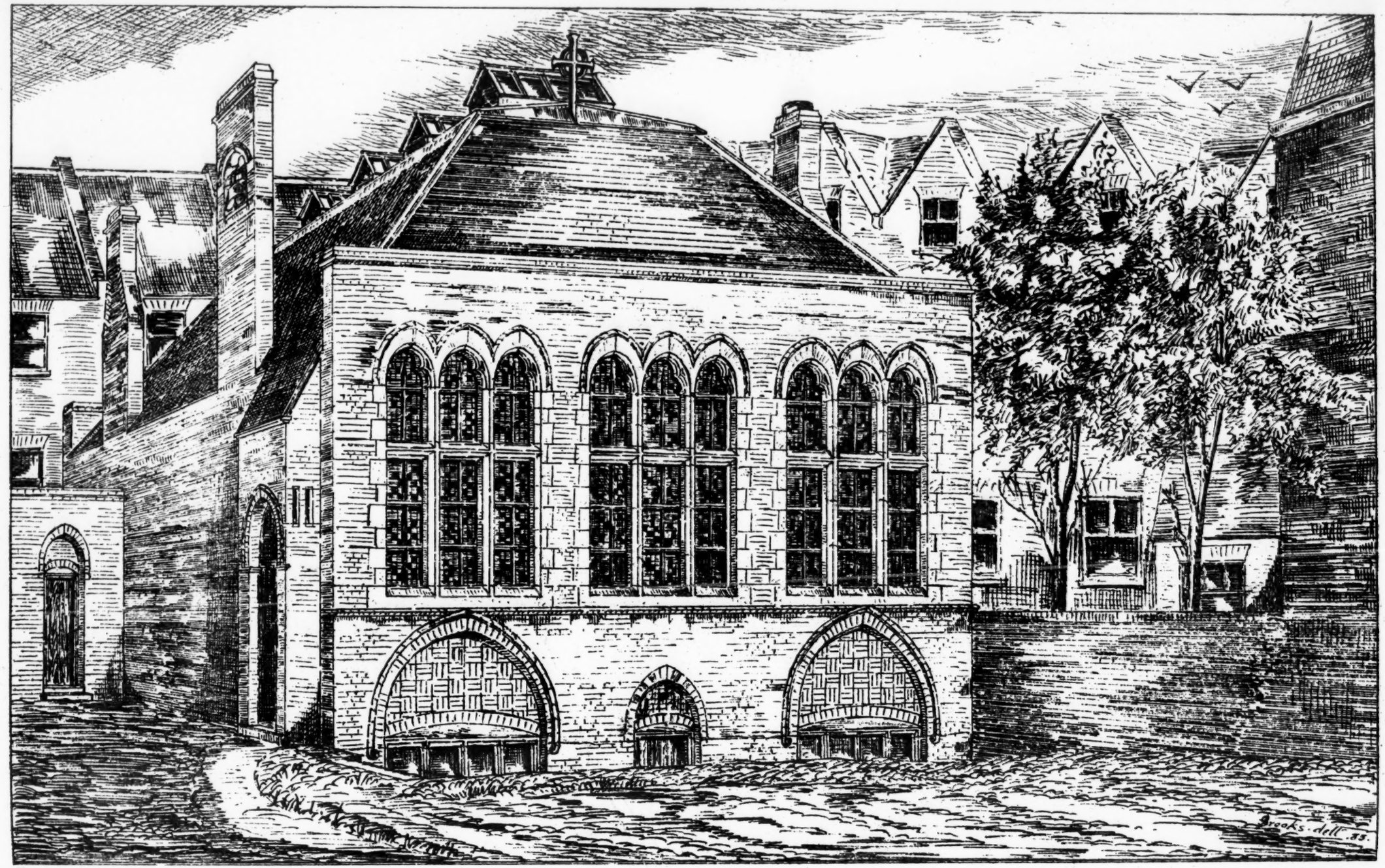
SCALE OF FEET.

T. GARRATT, DEL. 1883.

Whitsman & Bass, *Photo-Litho.* 236, High Holborn.

Wyman & Sons, Printers, Gt Queen St.

SHOP AND COTTAGE, SUTTON COLDFIELD, WARWICKSHIRE.——Mr. T. W. Cutler, F.R.I.B.A., Architect.



Vincent Brooks Day & Son. Photo-lith.

NEW MISSION CHAPEL, ST. FAITH.——Mr. J. M. Brooks, Architect.

SOUTH ELEV

10 5 0 10

Wyman & Sons, Photo-Litho.

NEW BUILDINGS, BRICK COURT, TEMPLE.—

LEVATION

20 30 40 FEET

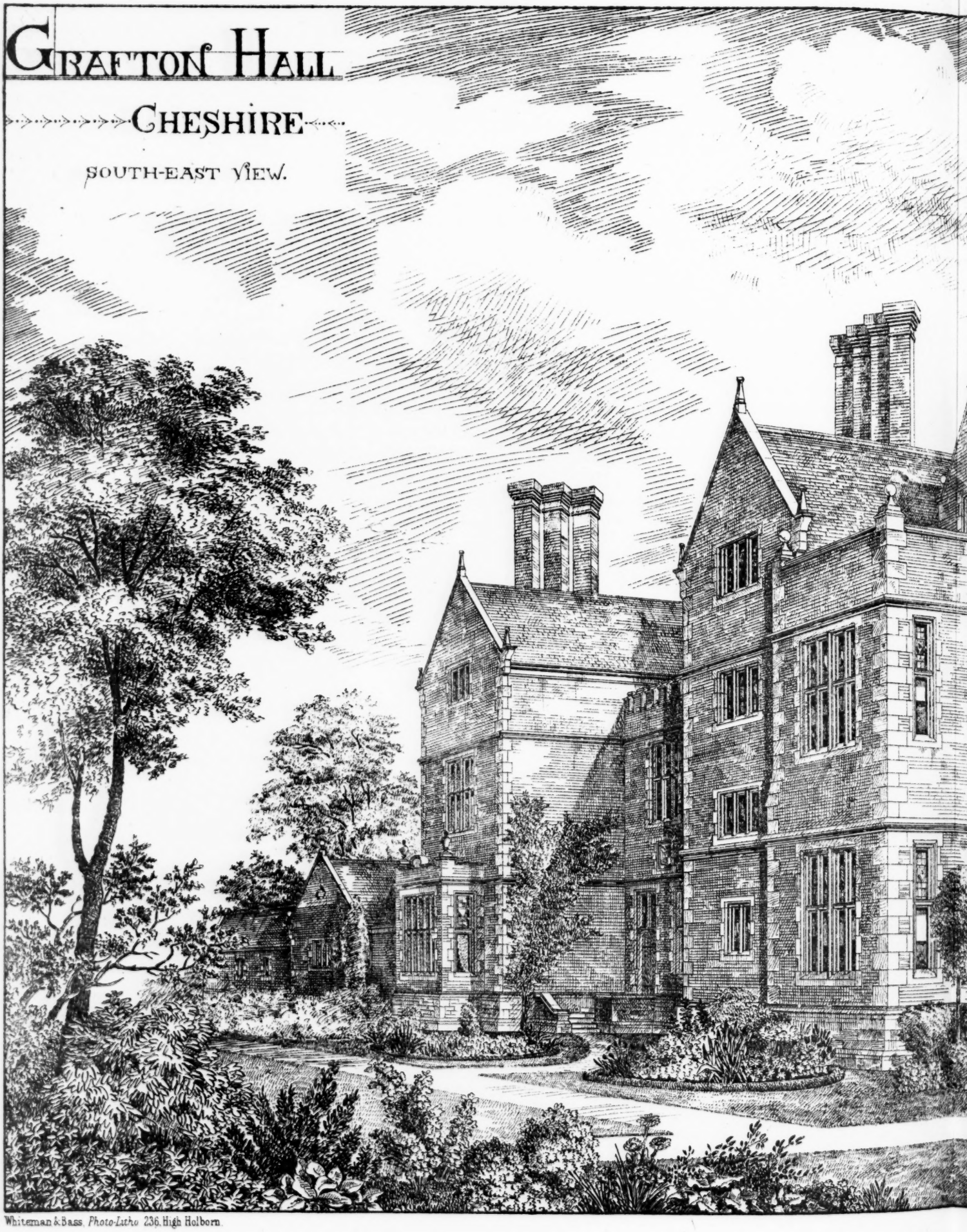
C. Queen St. London, W.C.

PLE.—Mr. J. Piers St. Aubyn, F.R.I.B.A., Architect.

# GRAFTON HALL

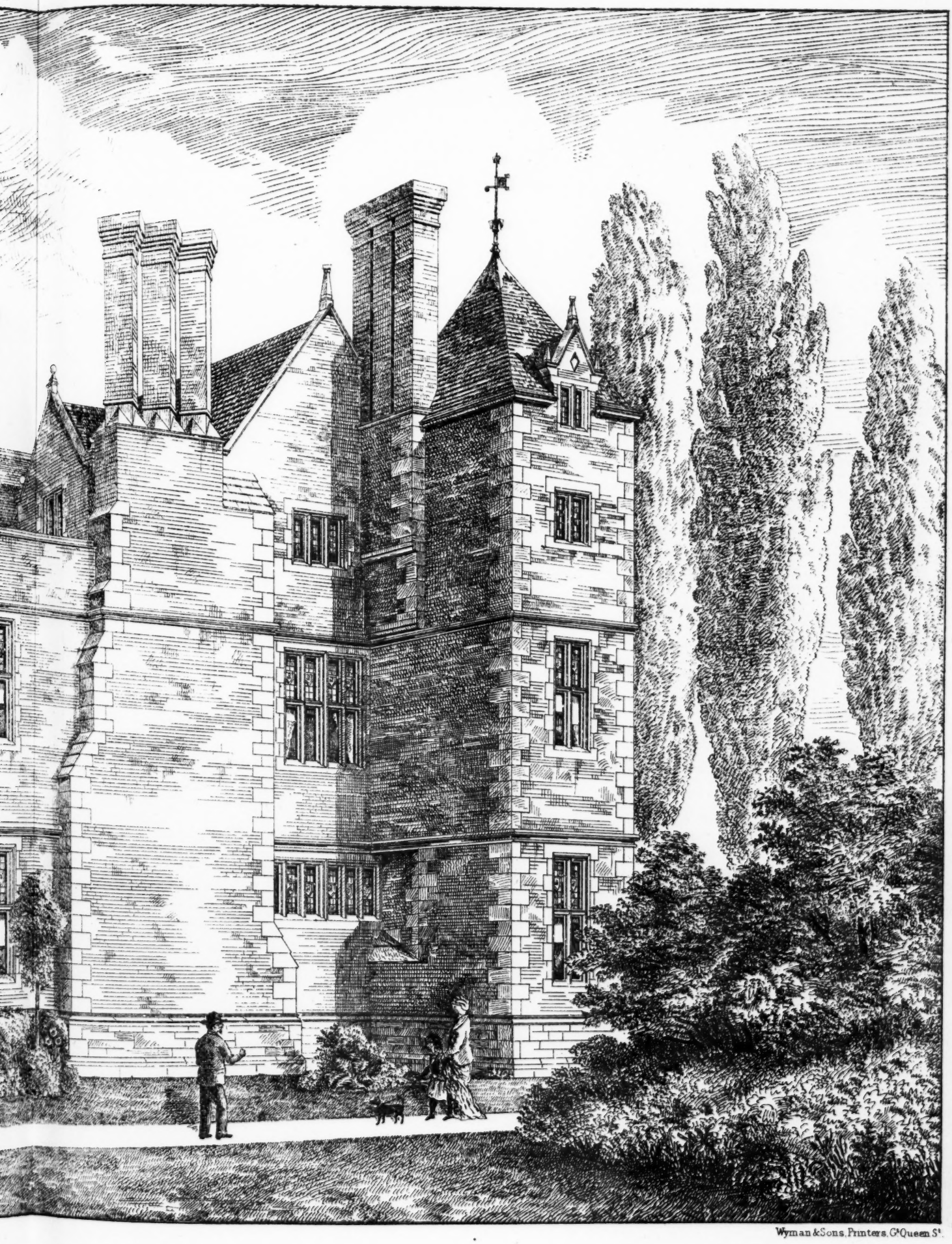
## CHESHIRE

SOUTH-EAST VIEW.



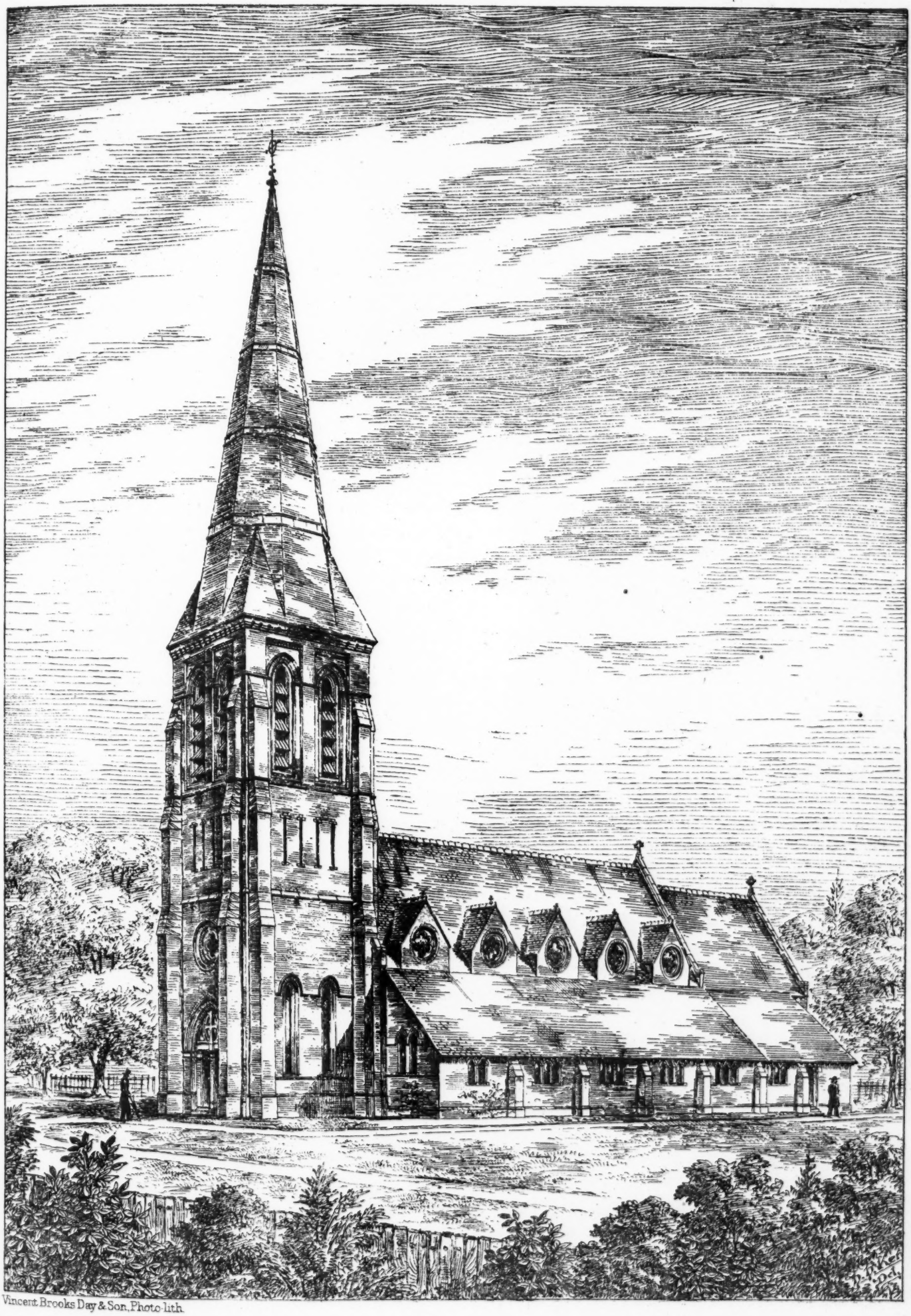
Whiteman & Bass, *Photo-Litho* 236, High Holborn.

AS RESTORED BY MR. JOHN



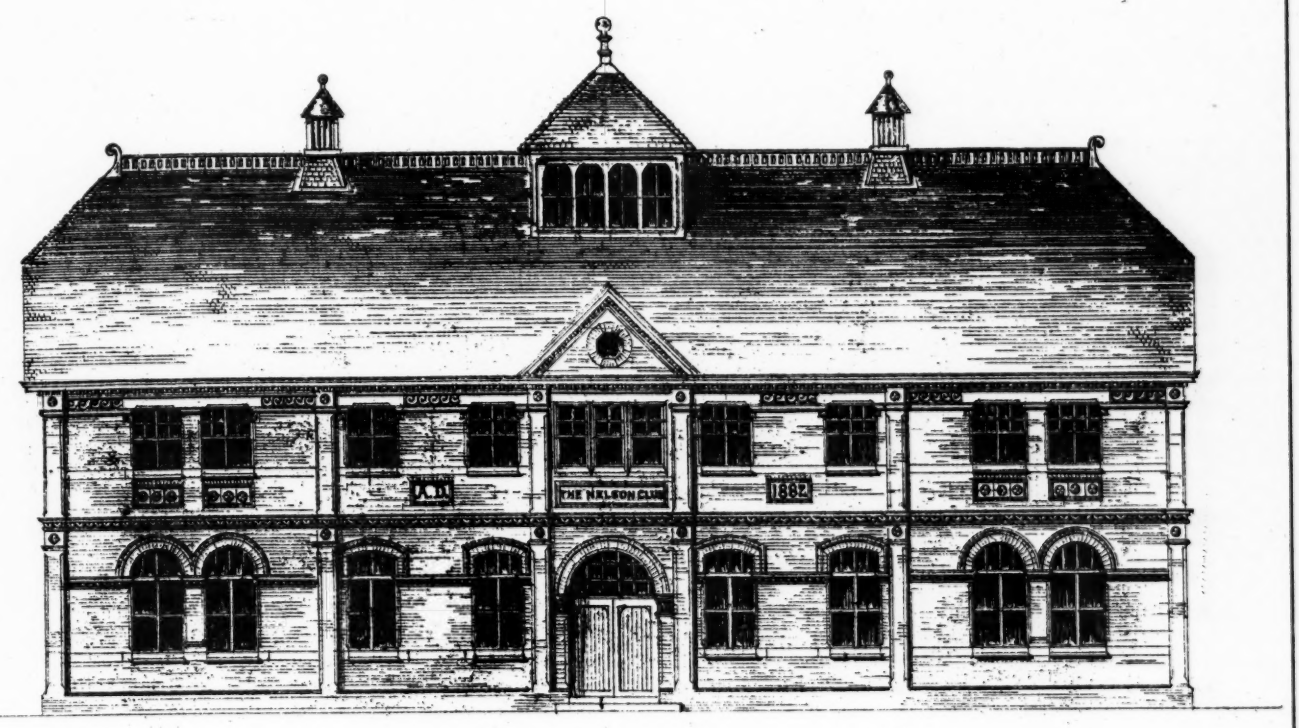
Wyman & Sons, Printers, Gt Queen St.

. JOHN BIRCH, ARCHITECT.

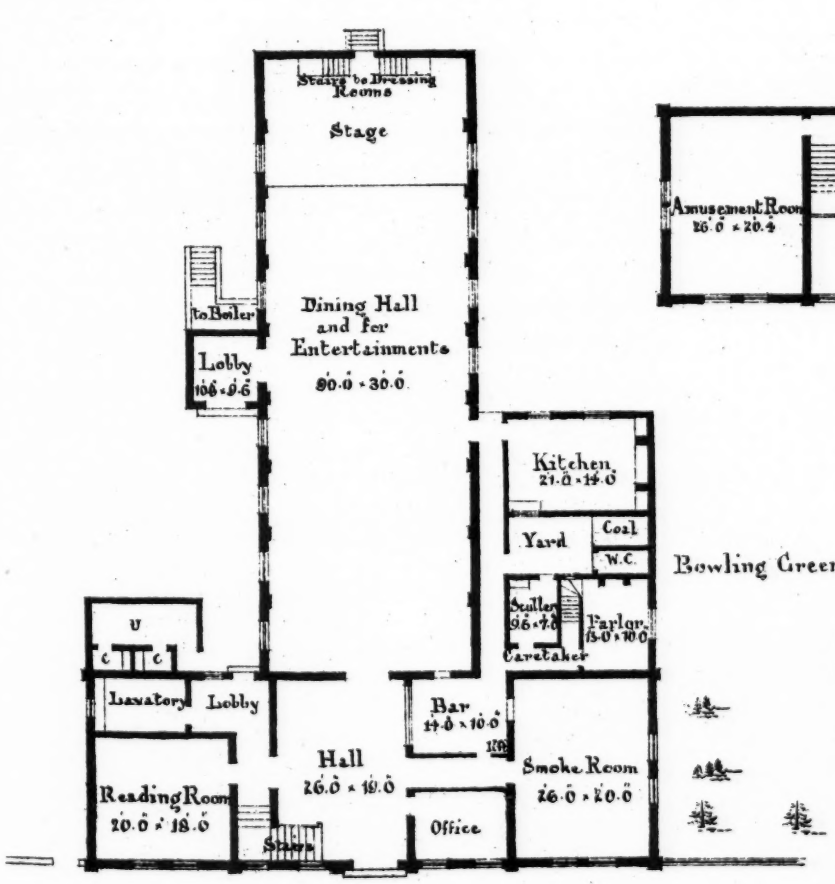


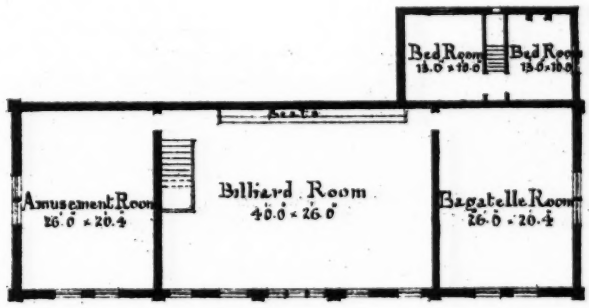
Vincent Brooks Day & Son, Photo-lith.

NEW CHURCH, DOVERCOURT.——Mr. J. E. K. Cutts, Architect.




Front Elevation Scale 8 Feet to an Inch




Upper Plan

Ground Plan Scale 16 Feet to an Inch

The Nelson Club.
Warwick.
Frederick H. Moore Archt

Whiteman & Bass, *Photo-Litho.* Wyman & Sons, Printers.

THE NELSON CLUB, WARWICK.—MR. F. H. MOORE, ARCHITECT.

## LOWER DOVERCOURT CHURCH.

THIS church, which stands on the rising ground overlooking the river, is being built to supply the wants of the population which is being brought to Lower Dovercourt by the building of large docks at Parkeston adjoining, which are now used for the large Channel steamers instead of Harwich. The building is to consist of nave of five bays, aisles, chancel, and chancel aisles, vestry, and tower and spire, the ground floor of which is to be used as a baptistery and porch. It is designed to seat 446 people. It is being built of red brick externally, and plastered inside, with the arches and jambs of red brick. Only about half the church is being built in the first instance, the contract for which is 1,595*l*. The estimated cost for the complete building is 4,500*l*. Mr. J. E. K. Cutts, 28, Southampton-street, Strand, is the architect, and Mr. Dobson, of Colchester, the builder.

## THE WORK OF ART STUDENTS.

AT the delivery of prizes to the students of the Birkenhead School of Art recently, Mr. Walter Smith, Art Director of the Technical College, Bradford, delivered an address to the students on the spirit in which their studies should be carried on, and advantages to be derived from them. After remarking that in going through England and examining the most prominent art schools, he had seen no better school and no better exhibition of drawings than in the Birkenhead school, Mr. Smith proceeded to say :—

"The successful students need to be reminded that their greatest prize of all they share with those who, having received none of these prizes which you can see and touch and carry away with you in a parcel, fancy themselves unsuccessful, for this greatest of all prizes is the formation of character, the discipline, the continued effort, the pursuit through difficulties of that which is good and admirable in itself, the devotion of leisure to self-improvement, and the tone of thought and habit of mind thus developed. That is the great prize. Let not those who have produced beautiful drawings suppose that they have in the works of art which received medals and prizes the treasures and rewards of study. It is not so. If all these drawings which I see around me were collected together and made into a bonfire, and their destruction should decrease the results of the education given in this school, then the teaching has been very bad, and that I know to be untrue; for the real value of the education you have received is in your heads, minds, and hands, and not upon these canvasses and papers, and that education has been received by those who lose as much as by those who win prizes, and will show itself, or its beneficent results, in time.

I would also like to give a warning note to the successful. As a master of a normal or training school for teachers, it has been my business to study the philosophy of education, in order that I might prepare those who had in the future to have charge of Public Schools. No two students are exactly alike, and, indeed, any two will be found to be very different in some things,—in character as well as in attainments, but chiefly in the power of learning and assimilating instruction, some being sensitive and of rapid mental action, and others dull and slow Those who do well, and do it easily and succeed quickly, are said to be brilliant, whilst those who get on with difficulty and improve slowly are said to be stupid. But allow me to remind you of the historical fact that, with a few marked exceptions, early brilliancy has often not developed into mature excellence, being like personal beauty, a dangerous gift, whilst many of the greatest men the world has yet produced have been decidedly stupid as boys; that is, they have been called so. This should be as much a warning to the prize-takers, as it should be encouragement to those who have temporarily failed to take prizes. Only, as a matter of fact, every great artist, or poet, or teacher has improved as he learned; the craftsman has got on, the student has learned, and the best works of all great men have not been those they produced because they were born artists, but those which, having exhausted their failures, they wrought, after being made. It matters not whether they were self-taught, or taught by others: the only difference being whether things taught them or men taught them, and this is circumstance only. What is the common characteristic of great men in all professions or occupations: wherein do they all resemble one another, or is there any common characteristic? Carlyle defined genius as the ability to do any amount of work. It is certain that the most common element of character in great men, no matter what their occupation may be, is perpetual work,—first, last, and all the time between, and that they found their pleasure in it. Thus Michelangelo was found studying his profession from a fragment in the Colosseum, after he was eighty years of age, and this fact accounted for his being the greatest artist of his time, if not of all time, which is more than probable. Thus I say that for ever learning and for ever working is the sign of genius; and, let me ask you, can you not always learn and work, if you choose? It rests with you to answer this in your daily lives.

Then I want also to say to the unsuccessful prize competitors that they are safe and on the right road if dissatisfied with their work. Guard against the moment when you become satisfied with that which you have done, for that means halting in your march; and spurn with contempt the feeling that you could do no better or not so well if you tried again, for that indicates that you have passed the meridian of your lives as students and thenceforwards are going down. Whilst you are growing as artists you must have many despairing and dark hours, the sense of inferiority and hopelessness, and if you have them not there is no hope for you. These are the artist's "growing pains," and are signs of expansion, which not to have would indicate that you are shrinking back to nothing. Without forming a habit of hugging sorrow, you may be sure that a certain amount of misery is necessary to your progress, and be also sure that self-satisfaction is a deadly assassin which destroys without even short shrift. If you are very miserable at your progress, and regard the work you can do with such contempt that you have no heart to go on, try to see some of the early and inferior work of the modern great artists. When I was a student and worrying at a subject I could not master, and suffering from these growing pains, I used to go with a fellow-sufferer and examine the early efforts of a genius who crowned the galaxy of Royal Academicians like a giant, and that gave us a little kindling of hope. That gave us courage to go on, inspired us with the gift of continuance, roused our spirits, and made us remember that the kingdom of art is like the kingdom of heaven, which the strong take by force.

To all of you I would say that this study of art will be profitable, either in your occupations as craftsmen or in your lives as human beings. Those who require a knowledge of drawing in their business will find that they will be better servants with skill of hand and eye than without it, more profitable to their employers and themselves, and infinitely happier men; whilst others who do not expect to employ their art power as a means of earning their livelihood, will fit themselves by art study to receive a revelation of the beautiful, that is the divinest gift a human creature can receive. I pity the man or woman who does not know how to draw, who goes through life without being able to enjoy the beautiful with understanding, whose eyes have never been opened by study of form and colour to the loveliness of God's creations on this earth, who look but never see, or see only as the man whose eyes were being opened by the divine touch, see men as trees walking. For the sense of sight is but a sense, but the faculty of vision is an exceeding great reward, that comes to us from patient, humble study in the studio of the great Creator of all things; a faculty we all have, though few of us ever develope it, and it can only be raised into healthy action by the study of art. To you who study art with humility and hope will come this divine revelation of the beautiful, as surely as have come to you the revelations of life and labour, and in due time will come to you the revelation of immortality, when you will see, not as through a glass, darkly."

**"Two Exhibitions of River Painting."** In the article bearing this title in our last (p. 820) a serious typographical error somehow escaped detection. Mr. F. Myers Boggs's oil studies are being exhibited by Messrs. Goupil & Co., of New Bond-street.

## THE FACADE OF FLORENCE CATHEDRAL.

SINCE our remarks last week (p. 820) in regard to the façade of Sta. Maria del Fiore, and the two proposed methods of completing it, we learn that the point has been decided in favour of the basilican termination, without the gables and pinnacles. A few nights since the Florentine Artists' Club, to which the decision of the question had been unanimously submitted, elected by 88 votes to 11,—and three abstaining voices,—the basilican termination as that most in accordance with the general design of the building; a decision in absolute opposition to the last wishes of the architect. We can hardly say, perhaps, that the success of De Fabris's design is so great in itself as to entitle his opinion to all the weight that might otherwise have attached to it; but he perceived what a good many people apparently do not, that there is much more Gothic than Classic element in the details of the building. People keep talking about Brunelleschi as if he designed the building, instead of having merely completed the crossing. However, we presume the point may be considered settled, and that the work will be continued in accordance with this determination; and before long visitors to the banks of the Arno may expect to see the beautiful Duomo entirely freed of its mask of scaffolding. To English travellers there will always be a singular interest in the connexion of the great work with their country, and on the façade the heraldic emblazonments of more than one famous English family will serve to remind the Florentines that to some extent England has paid back a portion of that long outstanding debt which, a *sindaco* of the Tuscan capital not so long since revealed to the world, England had been owing ever since the brilliant days of Edward III. *Tempora mutantur*. Florence now is so poor that she has scarcely been able to contribute a *soldo* towards the completion of her marvellous cathedral.

## THE DWELLINGS OF THE LONDON POOR.

THE following letters have passed between the Council of the Royal Institute of British Architects and Mr. Mark H. Judge, one of the Directors of the Artisans', Labourers', and General Dwellings Company, who are stated to be the largest owners of improved cottage dwellings in the world :—

"8, Park-place-villas, W. Dec. 12, 1883.

JOHN MACVICAR ANDERSON, Esq., Honorary Secretary, and WILLIAM HENRY WHITE, Esq., Secretary of the Royal Institute of British Architects.

Dear Sirs,—The important question of the condition of the habitations of the underpaid industrial classes and the abject poor, who may be described as the children of the community, inasmuch as they are powerless to help themselves, is now fortunately attracting the earnest attention of the public, and it therefore becomes of the utmost importance that reliable data should be forthcoming in order that the desire to improve the present state of things may bear fruit in wise action before the present wave of just indignation has spent itself.

I therefore venture to suggest to the Council of the Institute whether they would not be fulfilling a most important public duty at the present juncture if they could be the means of obtaining this reliable data. The question is one which cannot be solved without the knowledge and experience of the profession, and I beg, therefore, to ask the Council to consider the following proposal, viz.: That the Royal Institute of British Architects appoint a Special Committee to inquire into, and report on, the condition of the dwellings of the London poor.

I am, dear Sir, yours faithfully,

MARK H. JUDGE, Associate."

"Royal Institute of British Architects,
9, Conduit-street, Hanover-square, London, W.
December 20th, 1883.

MARK H. JUDGE, Esq.,

Dear Sir,—We duly submitted to the Council of the Royal Institute of British Architects your letter of the 12th inst., in which you suggest that the Institute should appoint a Special Committee to inquire into and report on 'the condition of the dwellings of the London Poor.' We are to state in reply that, however much the Council may concur in the general wish to ameliorate the condition of those dwellings, the

means at the disposal of the Institute for such a purpose are too small to penetrate the mass of difficulties which surround the question.

A generation ago a member of the Council made a noble effort to call public attention to the then state of things, and those efforts have been since renewed from time to time. Persons in authority, just awakened to the facts of the position, may, perhaps, be astonished at finding so much already done by Mr. George Godwin to throw light upon a subject, which, at last, appears to have been taken up in earnest. Indeed, the probability of an almost immediate appointment of a Royal Commission, to inquire into the condition of the dwellings of the poorest classes in London, is, perhaps, a proof of the magnitude of the task which you invite the Institute to undertake,—a task which seems to us to concern the metropolis at large, and to be the duty of a responsible government to organise and carry through.

We are, dear Sir, yours faithfully,
J. Macvicar Anderson, Hon. Secretary.
William H. White, Secretary."

## THE DESTITUTION OF THE POOR IN LONDON.

We have received a copy of a pamphlet on this subject by Mr. Hugh MacCallum, commenting on the mutual disadvantages, social and moral, arising from the massing of rich and poor respectively in opposite neighbourhoods of London; a rich quarter in one place, a poor quarter in another. We quote the following portion of the paper:—

"There seems to me to be very much to fear from this isolation in which we have compelled the poor to live. We have made them a class by themselves, with all class prejudices, ignorances, and jealousies. They are so far off from most of us, that to go into their midst is like going into a strange country, where you never expect to meet any one you know, and where you are received with toleration or cold indifference. To labour amongst the poor in London requires almost the same moral discipline and self-denial as to go out to India or China as a missionary, we have made, and are still making them, so much a race by themselves. To the average members of West End society, St. Peter's, London Docks, Mint-street, Borough, and the eastern fringes of the city are as remote as the Land's End, nay, to a large section of the community of the wealthier kind they are more remote and less known than even the lands beyond the sea. Yet, from Charing-cross, half-a-crown would take you in a hansom-cab to any of them.

Is this remarkable distribution of the various classes in London a satisfactory one? Is it safe for the community to have miles upon miles of streets where there is not merely plenty, but luxury, and then in another part to have nothing but miles upon miles of houses where there is not simply the absence of all the comforts of life, but, beyond this, all the accompaniments of waste, want, and wretchedness? What organisation have we that could possibly grapple with an outbreak of cholera next summer amongst one of the vast collections of poor people to which I have alluded? You could not perfect the sanitation of the district in a few months. Would public opinion, backed by popular panic, sanction the removal of the people, and the destruction by fire of the infected tenements? Very likely it would. But what would meet the difficulties of the case if ever the two millions of poor in London find a teacher and a leader such as other countries have sometimes found? What if the whisperings of discontent, that find but occasional utterance and hearing now, ever burst out into the loud and passionate cry of a people's despair at making no progress?

No progress in material comfort; no progress in social advancement; no progress in the fight after a share in the profit of their labour. No progress in aught but poverty and a weary length of years.

It seems to me that at such a time the thousands that we now drive together as into a pen would prove a strange and fierce army to overcome. Of course they would be overcome, but at what a cost!

Mixed up with all the poor in London we have compelled the respectable and struggling artisan of the lower class to live; and so that narrow border-land that separates self-respect and self-reliance from that lower stratum where both those qualities are despised, has been made common ground, and all its landmarks destroyed. I need not stop to prove these statements, they are facts within the knowledge of most of us, they are known to every Metropolitan officer of health. They should be known by the heads of the Local Government Board; whether they are, or not, is more than I can venture to say."

We cannot think that this state of things, this separation of rich and poor, is, as Mr. MacCallum seems to imply, a specially modern state of things. We concur with him in thinking it leads to selfishness on the one hand and hopelessness on the other, but this kind of classification of inhabitants has been a tendency of all great towns at all times, and is ruled really by some almost unavoidable practical influences which have little or nothing to do with social morality or responsibility. It is an example of the illogical manner in which people, with the best intentions, reason on these subjects, that the author repeats the cry raised by Lord Salisbury against railway and street improvements, as causes of the increased misery of the poor of London at present. This is in a paper the special object of which is to urge the importance of fuller and more frequent intercourse between poor and rich. Now it is an absolute fact that the existence of the Metropolitan railway has done more than any other practical fact to promote and render possible this very intercourse between East and West London which the author recommends. There is at present an amount of interchange of visits for social and philanthropic motives alike, between the regions around Aldgate and the West End, which, before the extension of the railway to Aldgate would have been simply impossible for a large number of persons, from the expense of transit. In the case of new streets also, the "partial evil" (exaggerated, we believe) is certainly "universal good" in the main.

## PROJECTED PUBLIC WORKS.

RAILWAYS, PIERS, DOCKS, HARBOURS, AND TOWN IMPROVEMENTS.

The private Bill legislation of the session of 1884 promises to average that of previous years in the time which it will devote to the consideration of projected public works of a varied character. The total number of Bills of every kind for which notices have been given is 248, a large proportion of which are in respect of railway undertakings, there being no fewer than 113 of this class, being nearly one half of the entire number of applications. Tramway projects contribute thirty-five (including Board of Trade applications for Provisional Orders). There are likewise thirty-six applications in respect of gas and water supply. New docks, piers, and harbour undertakings, add thirty-two to the list; whilst town improvement projects of a comprehensive character in different parts of the country, contribute twenty-two, the aggregate number of applications being made up of projects of a miscellaneous character. Classifying the Bills relating to railways, fifty of them are promoted by existing companies, who seek powers for the construction of additional works, and thirty-five are applications for the incorporation of companies, with powers for the construction of entirely new railways. Of the entire number of the railway Bills, eighteen are in respect of projects within the metropolitan area. Ten of the tramway Bills are likewise connected with the metropolis, and two of the gas and water Bills; five Bills are promoted by the Metropolitan Board of Works for various objects; four are promoted by the Corporation; and there are likewise fifteen Bills of a miscellaneous character connected with proposed undertakings in the metropolis, amongst them being a Bill by the Trustees of Sion College, for powers to purchase a site on the Thames Embankment, for the erection of new college buildings; a Bill by the United Telephone Company, for powers to break up streets, and erect posts, and carry wires for telephonic communication over or under any houses, streets, and land, within the City of London, and the limits of the metropolis; also two Bills promoted by companies proposed to be incorporated for constructing bridges across the Thames, one from Tower Hill to Horselydown, and others between the Tower and Stepney, and Greenwich; likewise a Bill for the construction of a subway under the Thames, by a new company, commencing at King William-street in the City, and terminating near Newington Butts; whilst another body of promoters have a Bill relating to the improvement of the Thames ferries and roads communicating therewith, applying for powers to make a new cut or channel between Blackwall and Limehouse, with locks and weirs, two swing bridges, between Poplar and Greenwich, and also powers to establish a steam ferry across the Thames. A Bill is promoted by the London Financial Association, as owners of the Alexandra Palace, seeking powers to sell the palace and grounds free from existing restrictions. There are thus altogether fifty-four Bills having reference to metropolitan undertakings, the principal railway projects amongst this number being one by the Metropolitan Company, for constructing a railway under the Royal Parks, between Praed-street and Parliament-street. There are also Bills for a railway between Hampstead and Hendon; between Dulwich and Croydon; London, Reigate, and Brighton; Croydon and Kingston; to Croydon direct; between the Ladywell station of the Mid-Kent branch of the South-Eastern and the Crystal Palace; between Tooting, Balham, and Brixton; and an electric railway from the west end of Oxford-street to the Royal Exchange; all promoted by new companies. The London Central Electric Railway Company also apply for powers to construct an electric line from Charing Cross and the Regent's Circus, to the Post Office. The two metropolitan railway companies promote a Bill for the construction of a subway from the South Kensington Station to the Albert Hall. The Bills promoted by the Metropolitan Board of Works include one seeking powers for constructing a subway under the Thames at Wapping; another Bill containing various powers as to new streets and metropolitan commons; also a Bill for powers to repeal the Metropolitan District Railway Company's Act with respect to ventilators in Victoria-street and on the Thames Embankment; a Bill for expanding the 144th section of the Metropolis Management Act, in relation to water-supply by the companies; and likewise a Bill in reference to the Fire Brigade expenses. The Bills promoted by the Corporation of London include one for amending the present Acts relating to the water-supply of the metropolis; another Bill authorising the Corporation to establish free ferries across the Thames; a third Bill sanctioning the continuation of the Metage and Grain Act, in order to provide open spaces and recreation grounds, and a Bill authorising the Corporation to sell or exchange lands in Epping Forest, and to convey lands to local authorities for preservation as open spaces.

As regards the provinces many of the Bills promoted are of an important character, including railway undertakings; gas and water projects; the construction of docks, piers, and harbours; numerous town improvement Bills; and other projected works of a miscellaneous nature. Of the railway Bills twenty-four are for the construction of entirely new railways by companies proposed to be incorporated. Amongst them is a Bill for the construction of a new line between Liverpool, Southport, and Preston; also a Bill for the construction of a new coast line from Preston, and through Lytham, to Blackpool; whilst the West Lancashire Company, whose present line is between Southport and Preston, seek powers for the extension of their system to the Preston docks, and through Lytham and St. Anne's-on-the-Sea, to Blackpool. There is a Bill for the construction of a new line between Aldershott, Farnham, and Petersfield; likewise a Bill for a new line between Walton-on-the-Hill, Banstead, and Caterham; together with Bills for several new railways in Monmouthshire, Glamorganshire, Denbighshire, and other parts of Wales. The London and North Western, Midland, Great Northern, London and Brighton, Great Western, Lancashire and Yorkshire, South Eastern, Manchester and Sheffield, London, Chatham, and Dover, and others of the leading companies promote Bills for extensive additional works at different points on their respective systems. Amongst the tramway Bills is one promoted by the Liverpool Corporation for the construction of tramways in different parts of the city, to be let on lease. There are also two Bills promoted by proposed new companies for the construction of tramways in Manchester and the several towns and districts around, with clauses authorising the use of steam power.

The gas and water Bills include, amongst

others, a Bill promoted by the Stockton and Middlesbrough authorities for the construction of new waterworks, including a pumping station, aqueducts, and reservoirs; and the King's Lynn Corporation promote a similar Bill. A Bill is promoted by a proposed new company for the construction of waterworks for the supply of water to Rickmansworth and other parts of Hertfordshire, and also certain districts in Middlesex, including parishes in the Harrow district not supplied by the Harrow Company. The Southwark and Vauxhall Water Company promote a Bill for extending their limits of supply to Ham, Petersham, Richmond, Kew, East Sheen, Roehampton, Mortlake, Barnes, Putney, and Wimbledon.

Amongst the dock, pier, and harbour projects is a Bill for the construction of a new pier and other works at Ventnor; also Bills for a new dock at Wisbeach; for new piers at the entrance to Swansea Harbour; for the construction of a central pier at Brighton between the two existing piers, by a proposed new company; for the extension of the south pier at Blackpool, 500 yards seaward; for a new pier at Weston-super-Mare; for the erection of a new pier and promenade at Hove; for the incorporation of a new body of Commissioners to construct and maintain a pier and harbour at Newlyn; also for new piers and other works at Folkestone, Dawlish, and Cromar. There is a Bill incorporating a company for the construction of new docks at Northfleet, consisting of a main dock 417 yards in length, and 200 yards in width, with two branch docks, each 400 yards in length, and 83 yards in width, together with river-walls, piers, and jetties; also a railway from the proposed docks in connexion with the South-Eastern line. It is proposed to incorporate the "North Sea Fisheries, Harbour, and Dock Company," with powers to make a tidal harbour, dock, piers, and other works, at Sutton-le-Marsh, in Lincolnshire, and also powers to take water from the North Sea. The London and St. Katharine's Dock Company promote a Bill for the construction of a new entrance to the Royal Albert Dock at Galleon's Reach, together with two piers and jetties. There are two Bills in connexion with the improvement of the River Dee. One of these Bills is for the constitution of a Conservancy Board, and the transfer to them of the rights and privileges of the River Dee Company and the River Dee Commissioners, with respect to the navigation of the River Dee, and the construction of a canal in the bed of the channel. The other Bill is of a similar character, authorising a conservancy Board consisting of commissioners or trustees to restore the depth of the River Dee, and to improve the navigation. The Manchester Ship Canal project, which was rejected last year, is included in the list under this head.

The Town Improvement Bills include a comprehensive project by the Brighton Corporation. It authorises the Corporation to construct and maintain a running wall, promenades, piers, and landing-places, with tidal, swimming, and other baths; also the building of shelter arcades, conservatories, and other works in the Madeira-road, on the sea-shore; the construction of lifts for carrying passengers up the face of the cliff, from the seashore to the Marine Parade; the erection of a wholesale provision market; also the erection of municipal offices, an arcade or bazaar, and other buildings; the transfer to the Corporation of 105 acres, known as Tenants' Down, in order to be laid out as a recreation-ground for the use of the public. The Bill contains clauses regulating the traffic of vehicles through the streets; powers prohibiting persons carrying advertisement-boards through the streets, also for prohibiting processions without the consent of the Corporation. Town Improvement Bills are also promoted by the Corporations of Leeds, Leicester, Longton, Dewsbury, Jarrow, York, Birkenhead, Croydon, Bristol, Chester, Bury, and Ventnor, and by the Local Board of West Derby, Liverpool, in all of which powers are sought for the widening of existing streets, the construction of new streets, increased powers over the construction of buildings, and general sanitary powers. The Birkenhead Corporation, by their Bill, seek powers for the widening of thirty-one streets and the formation of several new streets, also powers to purchase 131 unsanitary houses for demolition. The Croydon Corporation Bill contains clauses empowering the construction of new waterworks in Addington and Beddington. The Bristol Corporation, amongst other powers, ask for authority to prevent the construction of dwellings on lands in the city liable to floods, likewise powers as to the construction of the foundations of houses. The Bill promoted by the Dewsbury Corporation seeks powers for the erection of a new town-hall and municipal offices, court-house, and gaols; also for the erection of a museum, and the construction of public baths and public parks. The Jarrow Bill contains clauses for the erection of warehouses and machinery, and the construction of bridges over the North-Eastern Railway. The Bill of the Chester Corporation contains clauses empowering the Corporation to purchase the Dee bridges, and free them from toll. The York, Chester, and Bury Bills contain powers for the extension of the boundaries of those boroughs, and the re-arrangement and increase of the number of aldermen and councillors.

## CRYSTAL PALACE ENGINEERING SCHOOL.

THIS school completed the eleventh year of its operations on Saturday last, when the certificates awarded to the students by the examiners were presented by Field Marshal Lord Napier of Magdala, G.C.B., G.C.S.I., R.E., in the lecture-room of the school, in the south tower of the Palace. There was a large attendance of the friends of the students and of the school.

Lord Napier congratulated the students on their entering on the profession of civil engineering, which was taking every day a higher position in all parts of the world. Great works had already been executed by engineers, notably in the United States of America, but he thought that some engineering works in Great Britain had not yet been surpassed. He considered the medical and engineering professions nearly on a par in importance; each was instrumental in saving life, and the tear and wear of life; the engineer also saved time, abridged space, and changed the geography of the world. He considered architecture the branch of their profession that most pressingly claimed attention. We fell short in the production of structures combining grandeur and beauty with comfort, convenience, and adaptation to their intended purposes. He would press this point upon their consideration as demanding the attention of the engineers of the day. It was impossible to foretell what wonderful works remained to be achieved by the engineer. He had recently been giving some attention to the great bridge across the Firth of Forth, which was a remarkably bold work, spanning 1,600 ft. of sea by a structure 300 ft. above the water. Probably in the even not distant future that may come to be regarded as only an ordinary work. Reverting to architecture, he thought there was great room for improvement. It was important that they should make the most of their opportunities for observing both works of art and the operations of nature. Some of the greatest things in engineering were the work of practical men, elaborated by the mathematician. The mode of construction in the Forth Bridge, in the projection of the successive beams of a series, was a scientific development of a principle to be seen in structures in Thibet and Cashmere. Lord Napier concluded by wishing the students success in their careers, and expressing a hope that they cherished the gratitude that was due to Mr. Wilson and his assistants for their valuable services. Lord Napier then presented the certificates.

The lectures for the term were on "Materials and their Manufacture." Thirty-five students attended the lectures; thirty-two were eligible for examination, and twenty passed. The highest number of marks attainable was 273; Mr. T. B. F. Sam, a young gentleman of colour, was first, with 215; he was also second in merit for work in the fitting shop. The other students, who received lecture examination certificates, had from 208 down to 105 marks.

Thirteen certificates were awarded in the Drawing Office, Mr. J. F. Gage first. Eleven certificates were awarded for work in the pattern shop and foundry, Mr. H. W. Rogers first. Ten certificates were awarded in the fitting shop, Mr. C. J. Barley first. In the civil engineering section for students in the first term,—surveys, levelling, plans, and estimates for Parliament,—eight certificates were awarded, Mr. P. F. Oddie first. Second term,—working sections, specifications, working plans, calculations, estimates, details, &c., for a railway and dock,—five certificates were awarded, Mr. G. C. Burton first. Third term,—original designing, lattice, plate girder, warren, and other bridges,—four certificates, Mr. C. T. Spencer first, and Mr. F. J. Pigott second. These two students were specially distinguished by the examiner in his report as having such "acquaintance with this advanced branch of engineering as will inevitably give them a favourable start when they commence their professional career." Seven certificates were awarded to students in the colonial section, who during the last term have, amongst other work, made a very neat 4 horse-power horizontal engine. In the section for electrical engineering a certificate was awarded to Mr. A. J. Allen.

The examiners for the term were Mr. T. B. Lightfoot, C.E., M.E., and Mr. J. C. Coode, C.E. The reports of both gentlemen, written and given orally to the meeting, were highly favourable as touching the work and attainments of the students generally, and as to the value of the school and the efficiency with which it is conducted.

The number of students in attendance during the last term has been 76, being six more than the number attending in the term preceding, and the highest number reached since the commencement, when the school opened with nine students. The exigencies of the school have sent the lecture-room up to a higher floor in the tower, five floors in which are now occupied by the school.

## REFORM AT THE INSTITUTE OF ARCHITECTS.

SIR,—If you can spare a corner in your next issue for such a purely parochial purpose, I would respectfully invite Mr. Barry or Mr. Whichcord, or any other leading supporter of the reformed system of administration at the Institute, to give us, before the meeting of the 7th proximo, some idea of what is really found to be the advantage derived from the innovation. I observe that a motion is to be brought forward on the 7th, which seems to be meant to initiate a return to the old system; and there will be just time for a reply to this letter. The old executive scheme was this:—A president was selected for dignified influence, either an amateur of distinction or a professional man of exceptionally high standing; three vice-presidents from amongst the seniors; a Council otherwise composed of members of average age, to represent the great class of ordinary working architects; and two active honorary secretaries, one especially qualified for home business, and one for foreign; the secretaries holding office nominally *en permanence*, but obviously being unable to devote more than a very few years to their work, and the others changing in the usual way of such societies, by the retirement of a certain number annually. The new system, introduced some seven years ago by Messrs. Barry and Whichcord, is, on the contrary, this:—A Council composed exclusively of the very foremost members of the profession, holding office permanently, and each individual rising in turn to the dignities of vice-president and president, to retire after occupying the chair for two years into the supremely honourable order of past-presidents. I happened to be an absentee through illness at the time the change was made, and I have never been able to understand what were the arguments adduced by Messrs. Barry and Whichcord in favour of it; but I have been told that the meetings for its discussion were very thinly attended, and that apathy was their chief characteristic. The same apathy has been manifested in the matter ever since, the only exceptional instance being the enthusiastic election of the late Mr. Street to the Presidency a few months before his lamented death. But I must go on to explain that the change of character contrived for the Council was supplemented by a change of character contrived for the meetings, it being ordained that no business whatever should be allowed to be done at these assemblies of the members except the reading of papers and their discussion,—a change which virtually deprived the guild at large of all opportunity for participating in the transaction or discussion of affairs, or even for requesting information of any kind from the Council, and which, in fact, converted the Council into a secret board of directors and the mass of members into a passive body of shareholders. Now, we have no difficulty in remembering the charming activity and enterprise which were manifested at the fortnightly meetings

in the days of Professor Donaldson and Sir William Tite, and under such secretarial direction as that of Mr. Nelson, Professor Lewis, and Sir Digby Wyatt. Neither is it easy to forget the vigorous public action of the Institute in those times when Cabinet Ministers received deputations of its members, when professional manifestoes were issued with effect, when an intimate correspondence was maintained with kindred societies all over the world, and complimentary courtesies freely exchanged with them, and when at least one famous victory in the Legislature itself was achieved through the instrumentality of the Institute's direct action upon public opinion. We can also recall the gracious way in which the nomination of new members of council was so contrived as to bring every man into notice in his turn, so soon as he had attained a certain professional standing, and thus to confer upon him a mark of recognition which was not only most welcome to his *amour propre*, but, if the truth must be told, duly beneficial to him in business. The question I have to put, then, is simply this:—Have these ends been better served by the reformed system of administration, or have they been not so well served?

I am regarding the Institute, of course, as a public and not a private institution, a learned society, an artistic, scientific, and literary guild; and I am bound to say that I love to look back upon the old system, with its undisturbed equality and consequent fraternity, its freedom, generosity, activity, and general usefulness. I can see nothing in the new system to compensate for the surrender of all this; and when I go to the meetings (which is seldom, for they seem to have lost interest to the men I used to see there), and survey the circle of the Council sitting as a melancholy caste apart, and apparently doing nothing, I am sorry to feel that the vaulting ambition of Messrs. Barry and Whichcord has simply "o'erleapt the selle and fallen on th' other side." Pray let me put into shape a few plain questions. Have the promises of Messrs. Barry and Whichcord been realised or not, that the Council would be continuously composed of the very foremost men of the profession, to whom office would be "an object of ambition," and whose artistic, scientific, and literary pre-eminence would confer a new dignity and lustre upon the Institute? What are the nature and extent of the influence which the Council is now actually found to possess with the learned societies, the foreign academies, the national and municipal authorities? What is the work which the Council performs, now that the constituency is unworthy to participate in it, or even to be informed of it? Are the meetings at Conduit-street as attractive as they used to be? as genial? as interesting? Do the members of Council produce the papers, or even lead the discussions? What compensates those gentlemen who during the last few years have been denied the honour of being placed in their fair turn on the Council, as a right of professional recognition of which their predecessors in seniority had always enjoyed the very considerable benefit? Perhaps it is very much to the credit of the Institute that the mere selection of office-holders has never been a bone of contention. It is a peculiar merit of this guild that its members are all men of business, all in harness, and all pretty equally qualified by the nature of their everyday work to manage affairs. It matters very little, therefore, who holds office or who does not. The "house list," for this reason, is scarcely ever interfered with. But I think the necessity is all the greater for the acceptance of a general policy based upon the especial avoidance of bureaucratic reticences, of invidious and spurious distinctions, and, above all, of everything that savours of the repression of individual earnestness, the material out of which all corporate influence has to be made. We have given the new system a fair trial, and if it cannot be shown to have advanced the true interests of the society and the profession, it is high time we tried the old system once more, which used to work so well.

Robert Kerr.

**St. Philip's, Southport.**—We hear from Southport that upwards of fifty designs have been sent in competition for the new church for St. Philip's Parish, Southport, the whole of which will be publicly exhibited in the Atkinson Art Gallery, Southport, on and after New Year's Day, when the Committee have decided on the successful design.

## THE CONSTRUCTIONAL VALUE OF IRON AND CONCRETE IN COMBINATION.

Sir,—Although agreeing with Mr. Faija (p. 804) that the preparation of concrete deserves the most careful attention, I must take exception to the statement in his letter that "the combination of two such different materials" as are concrete and iron "in one member must result in the entire uselessness of one or the other." Your footnote, sir, expresses the theory of the combination of iron, as a tensile member, with concrete, as the compressional member. That the truth of this theory is sustained in practice, I will endeavour to prove. I find in my notebook the following particulars of experimental tests of concrete and concrete and iron beams, made by Mr. Kirkaldy for Mr. Hyatt. (The latter gentleman, I believe, deserves the credit of first practically applying the theory of the combination of iron and concrete):—

| Testing Mark. | Description.* | Weight of Iron Used. | Dimensions. | | | Test. | | Unit of Beam Strength |
|---|---|---|---|---|---|---|---|---|
| | | | Length. | Width. | Depth. | Bearing. | Load. | |
| | | lb. | ft. | in. | in. | ft. | lb. | lb. |
| K 5,544 | Cement only..... | ..... | 6 | 12 | 8 | 5 | 3,192 | 20·7 |
| K 5,537 | Concrete only.—Proportions, one of concrete to two of crushed stock-bricks ..... | ..... | 6 | 12 | 8 | 5 | 1,484 | 9·7 |
| K 5,548 | Concrete beam with five ¾-in. round iron ties at bottom, below the neutral axis ..... | 10 | 6 | 12 | 8 | 5 | 9,274 | 87·4 |

* Only the best London Portland cement used. The beams were tested two or three months after being made.

The foregoing experimental tests are evidence of the value of iron as an auxiliary to concrete.

By structurally analysing a beam composed entirely of concrete it becomes clearly evident that the limit of its strength is only equal to its weakest characteristic, viz., that of the tensile strength of the part below the neutral axis of the beam. The tensile strength of concrete composed of the best London Portland cement, in the proportion of 1 of the former to 1 of clean river sand and 2 of aggregate (clean crushed stocks), is equal to 500 lb. per square inch nine months after being made, whereas the compressional strength may be taken as equal to 1,800 lb. per square inch. In order, therefore, to fully utilise all the strength possessed by concrete, when applied for girder purposes, such additional strength, in the form of wrought-iron tie-rods, must be made to the part of the concrete beam or girder below the neutral axis, and subjected to a tensile strain as will make it equal to the superior compressional strength of that part of the concrete beam above the neutral axis. This principle of adding to the tensile strength by means of the rods, is only another form of trussing as applied to wooden beams.

In the absence of more extended data as to the strength of iron and concrete applied in the manner described, I have arranged the following formula,—which I submit with deference,—for ascertaining the strength of concrete and iron beams, where, by the addition of iron, the tension and compressive strength have been made to equal each other:—

For a concrete and iron beam, both ends supported, and with a distributed load. Note, concrete composed as follows:—1 part of Portland cement, 1 of sand, and 2 of aggregate.

L = length between bearings, in inches.
B = breadth of beam, in inches.
D = depth of beam.
W = breaking weight, in cwts.
K = 2·7.

Then $\frac{8\,KBD^2}{L} = W.$

When the ends are supported, but with the load in the centre of the concrete and iron beam,

then $\frac{4\,KBD^2}{L} = W$

Safe load $\frac{W}{4}$.

Approximately the ultimate strength of a beam composed entirely of concrete may be taken as equal to $\frac{W}{10}$.

The following are some of the great advantages possessed by a carefully prepared concrete and iron beam:—

It is incombustible.

It is fire-resistent; has practically no factor of expansion and contraction.

It is incorrodable, as the iron is well protected from oxidisable influences.

It is comparatively inexpensive.

It is very durable.

It has the characteristically monumental appearance of stone.

It can be effectively decorated, and is, in my opinion, the girder *par excellence* for architectural work, where monumental beauty, combined with strength, durability, and low cost are the desiderata.

B. H. Thwaite.

Sir,—Is Mr. Faija's theory that "concrete being composed of materials which are of themselves incapable of tension or deflection, the concrete itself must therefore be, and is, of the same inflexible nature," correct? Mr. Faija gives no information as to any experiments that have been made with a view of substantiating that theory.

In testing a concrete floor by dropping heavy weights upon it, the vibration is very sensible when no fracture has occurred. Lieutenant-Colonel Seddon, R.E., some years ago made some experiments with concrete, and one of these was with a slab 6 in. thick, having a clear bearing of about 14 ft. 6 in. by 7 ft., and resting on walls 18 in. in thickness. The result, as given by Lieutenant-Colonel Seddon in his own words, was—"Began to 'bend' with 15 tons, rising off outside edges; with 32 tons, it cracked slightly; load increased to 43½ tons, with no appearance of crack altering. The slab had tilted up about three-quaters of an inch."

This latter portion of the result appears somewhat extraordinary, and, except from so trustworthy a source, would scarcely appear credible; and as nothing further is stated relative thereto, we are led to infer that the slab remained unbroken.

This seems to me to entirely negative Mr. Faija's theory "that as soon as deflection commences, so does fracture, and that the end is not far off."

Thomas Potter.

*Alresford.*

## ARCHITECTS' ASSISTANTS.

The status of the architectural assistant can scarcely be considered apart from the question of professional education, of which the present system appears to have given rise to so much dissatisfaction. Practising architects have been accused of accepting premiums for imparting instruction to pupils; whilst the latter, it is said, are completely left to their own devices during their period of apprenticeship, and at its close are launched upon their professional career without those qualifications which are necessary to enable them to procure their own livelihood. Further, it is alleged that some practitioners are quite unscrupulous as to the number of pupils they receive into their offices, and that in many instances, duties that ought to be delegated to a paid staff are performed gratuitously by those who, according to their own account, have paid premiums merely to be victimised, while their brethren, whose education is supposed to be finished, are, to parody a well-known verse, "ruined by pupils' cheap labour."

Now, with respect to the former charge, it is a very grave one to bring against a professional body, since it amounts to no other, in plain English, than that of obtaining money under false pretences. We do not, however, suppose that the disappointed ones whose voices have been raised so loudly in protesting against the existing state of things ever seriously contemplated such an interpretation of their outcries; we merely point out that such is the logical tendency of many of the complaints that have been made. The position of an architect's pupil is often a perplexing one. The profession embraces such various branches of study, that a student may well feel puzzled at the array of subjects demanding his attention. He does not know where to commence, if he be left to himself, and he really stands in need less of actual instruction than of

timely counsel and guidance. He may not relish the dull routine of office work that is put before him, because he cannot see that its performance can serve to qualify him for the position he hopes one day to occupy. A young man with a taste for drawing, and a head filled with high-flown ideas, is too often prone to think his time wasted upon such prosaic functions as copying specifications, or tracing contract drawings; and so, from neglect or implied unwillingness to fulfil such duties, many a pupil has been left to run his own course, instead of profiting by the experience placed within his reach. Let us not be misunderstood; we do not, for a moment, wish to discourage youthful ambition. Probably a student who does not start with some Utopian dreams may become a useful man, but will never prove himself a very talented one; for it is the misfortune of genius often to commence at the wrong end of the chapter, and the most unpromising beginners have sometimes made the greatest successes in after-life. But those pupils who think that their period of probationary study would be more advantageously passed in some academy, where design and construction could be taught upon systematic principles, lose sight of the importance of acquiring that practical knowledge of business routine which can only be gleaned in an office, where a young man will commonly best serve his own interests in the long run by making himself of real service to his master.

There is no doubt that many architects have derived benefit from the labours of intelligent and industrious pupils; such benefit is sure to be mutual, and no time or attention bestowed upon the instruction of those who display aptitude can ever be regretted. Certain it is that the receipt of premiums is a consideration to many in these days of keen professional competition, and those who wish the custom to continue will not neglect to perform their part, and to make the advantages of a professional introduction well worth paying for. But a busy man cannot be expected to sacrifice his time to the instruction of those who are indisposed or unable to profit by his teaching, and who have only themselves or their guardians to thank if they have adopted a profession for which they are by nature unfitted.

It has been said that some architects fill their offices with articled pupils, by whom those duties are performed that might otherwise be done by paid assistants. We should like to know what those duties are. Gentlemen can scarcely be blamed for not employing salaried clerks, when they can obtain gratuitous help so easily; but if the work of an assistant can be done by a pupil, who is more or less untaught, what is the value of his services? We constantly hear that the profession is greatly overstocked, and the number of advertisements for "situations wanted," to be seen in our journals bears sad testimony to the fact. There is no doubt that many assistants are out of employment from time to time during the year, and that the fact is, in a great number of cases, due to no fault of their own; still it is impossible to be blind to the unsatisfactory character of much of the assistance rendered by those whose qualifications are often most ostentatiously set forth in advertisements. The gentleman who is clever in Gothic or Classic design, a first-class perspective draughtsman and colourist, thoroughly well up in construction, capable of taking off quantities, and well acquainted with surveying and levelling, and whose terms are moderate, is frequently to be met with upon paper; but is it likely that he can in reality excel in so many branches of professional activity, and yet find it difficult to obtain employment, except upon "moderate terms"? We fear that some of the younger men, in their eagerness to secure engagements, are sometimes tempted to overstate their qualifications, and if they do not succeed in giving satisfaction in the too great variety of duties they undertake, are apt to lay themselves open to the suspicion of being incompetent in all. Far better would it be for architects' assistants, if they would content themselves with working each upon those lines for which they find themselves specially fitted. By so doing, they would narrow the limits of competition, and we should then hear fewer complaints of the alarmingly overcrowded state of the profession.

Suggestions have from time to time been put forward as to the adoption of some system of combination among architects' assistants upon the trade-union principle. We do not think that any such scheme is likely to meet with general approval. We cannot close our eyes to certain evils inevitably resulting from the organised protection of labour,—evils that are felt in a more marked degree in proportion as the particular class of labour excels in degree of complexity. In the case of bricklayers, for example: we know that a first-class bricklayer, with the assistance of a labourer, can lay as many as 800 bricks per day, while an inferior hand might not lay more than 350, and that these two men are both placed upon the same level by trade-unionism,—both perform the same work, and strike for the same wages. Here is a practical discouragement to all effort at individual excellence; but perhaps, in the case of bricklaying, this is not a very serious consideration. To maintain that one man is as good as another in a branch of industry where there is not a very great scope for the display of personal merit may not be productive of much harm, although the result must always be demoralising; but in the comparatively complex function of an architect's assistant, the principle of equality between man and man could not be admitted without disastrous consequences. Protection could only mean protection for the incompetent.

We trust we shall never see practising architects and assistants drawn up in two hostile armies, each against the other. We think such a state of things exceedingly improbable. The wiser among both classes know too well how far their interests are identical. Patient, conscientious effort on the one side, kindly recognition on the other, sympathy and forbearance on both sides,—there is much of these: may there be more.

## HULL GENERAL INFIRMARY.

This building is to be entirely remodelled, and to have two new wings added to it, in accordance with the plans prepared by Messrs. H. Saxon Snell & Son, architects, of London.

The plan of the present structure, erected in the year 1784, is such that the administrative offices and sick wards are all contained under one roof, with the result that a large proportion of the officers are continually reported as suffering from hospitalism. It is, in consequence, proposed to cut two gaps through the principal front, and place the officers' rooms and kitchen offices in the centre block so formed, and the sick wards in the detached portions at either end, and, when to these are added the proposed new wings, the building will accommodate 262 patients. An out-patients' department is also to be erected as a detached building upon a site adjoining the Infirmary grounds, but with a public entrance from Brook-street.

## THE NEW BOROUGH ASYLUM FOR HULL.

This important building was opened on the 8th inst., by the Mayor. The building occupies a site, on rising ground, midway between Cottingham and Willerby. It has a frontage of 760 ft. and a depth of 440 ft., but the buildings are not lofty, being spread over so large an area. The *Hull Packet* describes the plan as that of a composite structure, forming an oblong but little developed from a square. Consider the frontage as making one of the sides of this oblong. Pierce the centre of the one side and produce to the other. This will run in a direction from south to north. The southern central position begins with the administrative block, and is the chief entrance to the place. It projects in front of the rest of the asylum. Next to this is the dining and recreation hall, a lofty apartment with open roof, and having at the upper end a platform or stage, and ante-rooms. It will accommodate about 700. Next comes the kitchen, divided by a corridor from the dining-hall and sculleries, together with the bakery, flour stores, general grocery stores, vegetable and potato room, larder, and dairy. The rooms are fitted up with the most modern appliances, and the cookery department especially, by having the excellent kitchen fittings and stoves of Messrs. Benham & Son. Over the larder, dairy, &c., are the bedrooms for the cook, kitchenmaids, housemaids, and the patients employed in the kitchen. On either side of the kitchen run the connecting corridors, through which the patients pass to the dining and recreation hall. Into these open the attendants' mess-rooms, one for each division, and conveniently placed in close proximity to the kitchen, with the cook's room adjoining. Next, in the middle line running down the structure, is a suite of rooms, comprising the surgery and patients' visiting rooms. These, with the kitchen and corridors, inclose a square, in which stands the detached meat larder. A sub-way opens also into the square, and allows the meat and vegetables and other provisions to be readily brought to the kitchen and general stores. Finally, there is the block which contains the general stores, the clerk's office and sitting-room, the porter's room, general waiting-room, committee-room, and superintendent's office. Over these are placed the clerks' bedrooms, two spare bedrooms, the chaplain's room, library, and porter's bedroom, &c. This completes the central portion terminating at its northern extremity. The building incloses on either side two open quadrangles of considerable extent, and laid down in grass. These are airing courts, one division being appropriated to the male and the other to the female patients.

The infirmary blocks are at the north end, or transversely with the administrative department and dining hall, and have two stories. The floors provide all necessary accommodation for patients, including a central day-room, with four small dormitories, six single rooms, two attendants' rooms, a kitchen and scullery, and a small visiting-room on each floor. The bath-rooms, lavatories, and water-closets are in a detached building on the north side of the infirmary, with a lobby which admits of cross ventilation.

The block for violent and troublesome patients is placed on the outer side of the square, and consists of a large day-room with two adjacent corridors, which can be closed by glass doors, and used as separate day-rooms if found necessary. In connexion with this ward are twelve single rooms and two attendants' rooms. The store-rooms, closets, urinals, and lavatory are in a detached block, with gallery and cross ventilation. The blocks for chronic and working patients have on the ground-floor three large day-rooms, opening one into another, together with a spacious lavatory and bath-room, stores, and attendants' rooms. The general bath-room is closely adjoining, and with its roomy dressing-room is so placed as to serve for both these and the preceding blocks. The water-closets are detached as in the other blocks, with cross ventilation between them and the day-room. On the first floor are the dormitories, lavatory, a single bath, store-room, and attendants' rooms. The blocks for recent cases are built out in front of the connecting corridors, so as to enjoy a southern aspect and to leave the corridor free for traffic, and to avoid what the architects consider the worst feature of some modern asylums, viz., a sub-way or covered way. They consist of a suite of rooms on the ground-floor, a day-room, dining-room, and dormitory, seven single rooms and two attendants' rooms, a scullery, store and bath rooms. The lavatory and water-closets are detached as in the other blocks.

On the first floor are the epileptic and suicidal dormitories, single rooms, attendants' rooms, lavatory, and closet. They are designed in accordance with the Lunacy Commissioners' suggestions. No special day-room accommodation has been set apart for the epileptic patients, the architects being of opinion that it is better on the whole to divide the epileptic population over the general wards, according to their peculiar dispositions. The violent would, therefore, be placed in the ward for the more troublesome; the quiet and well-behaved in the working block; the feeble in the infirmary.

The general dining-hall, recreation-hall, and attendants' mess-rooms are placed in the position which is most convenient; that is, near to the kitchen and sculleries.

Most of the wards are provided with verandahs for air and exercise without exposure; this feature is especially useful in the infirmary and receiving-wards.

The laundry is situated on the north side of the corridor, near to the female working and receiving blocks. It is fitted up by Messrs. Bradford & Co., of Manchester. Externally, the building is of red brick, with slate roofs. The corridors are of stone, as are also the staircases.

Messrs. G. Jackson & Son, of Hull, were the general contractors. The other contracts were taken by Messrs. Haden & Sons for the

general engineering; Messrs. Benham & Son for the kitchen fittings and stoves; Messrs. Bradford for fitting up the laundry; Mr. J. E. Elwell, Beverley, for the church fittings; and Messrs. Porter & Co., of Lincoln, for the gasworks.

The cost of the building was thus stated by Alderman Witty, chairman of the Asylum Committee,—Land, 12,770*l.*; contracts for building, &c., 55,795*l.*; estimated cost of additional work, 3,397*l.*; furniture, 5,410*l.*; total, 77,372*l.*

The architects are Messrs. Smith & Brodrick, Hull.

## INTERNATIONAL HEALTH EXHIBITION.

The following sub-committees, appointed by the Executive Council of the Exhibition, have met at the Society of Arts:—

FOOD.—GROUP I.

*Monday, December 17th.* — Present: Sir J. B. Lawes, bart., LL.D., F.R.S., in the chair; Professor Church; Professor George Fleming, LL.D.; Sir B. T. Brandreth Gibbs; Professor H. N. Moseley, F.R.S.; Dr. David S. Price; Mr. John M. Thomson; Dr. Voelcker, F.R.S.; Mr. H. Trueman Wood.

THE DWELLING-HOUSE.—GROUP III.

*Friday, December 14th.*—Present: Sir Robert Rawlinson, C.B., in the chair; Dr. Alfred Carpenter; Mr. H. H. Collins; Mr. C. N. Cresswell; Mr. T. W. Cutler; Mr. J. Bailey Denton; Mr. W. Eassie; Mr. R. E. Farrant; Mr. Rogers Field, M. Inst. C.E.; Captain Douglas Galton, C.B., F.R.S.; Mr. George Godwin, F.R.S.; Mr. E. Hoole; Mr. Baldwin Latham; Mr. Shirley F. Murphy; Dr. G. V. Poore; Mr. George Shaw; Dr. Thorne Thorne; Mr. E. Turner, F.R.I.B.A.; Mr. George Vigers; Mr. H. Trueman Wood.

*Wednesday, December 19th.*—Present: Captain Douglas Galton, C.B., F.R.S., in the chair; Mr. A. T. Atchison; Mr. W. R. E. Coles; Mr. H. H. Collins; Dr. Corfield; Mr. Thomas W. Cutler; Mr. Heisch; Mr. Baldwin Latham; Professor T. Hayter Lewis; Professor Chandler Roberts, F.R.S.; Mr. Frederic Scott; Mr. George Shaw; Mr. George Vigers; Mr. Greville Williams, F.R.S.; Mr. H. Trueman Wood.

THE SCHOOL (GROUP IV.), AND EDUCATION (GROUP VI.).

*Tuesday, December 18th.*—Present: Mr. E. N. Buxton in the chair; Mr. B. St. John Ackers; Dr. T. R. Armitage; Mr. J. G. Fitch; Dr. J. H. Gladstone, F.R.S.; Major-General Hammersley; Mr. T. C. Horsfall; Mr. A. C. King; Colonel W. R. Lewis; Deputy-Inspector-General F. J. Mouat; Mr. E. R. Robson, F.R.I.B.A., F.S.A.; Mr. H. Trueman Wood.

THE WORKSHOP.—GROUP V.

*Saturday, December 8th.* — Present: Dr. G. Buchanan, F.R.S., in the chair; Dr. A. Dupré, F.R.S.; Mr. Alexander Redgrave; Mr. Gilbert Redgrave; Mr. H. Trueman Wood.

*Saturday, December 15th.*—Present: Dr. George Buchanan, F.R.S., in the chair; Dr. Edward Ballard; Mr. J. H. Bridges; Mr. A. Redgrave; Mr. G. Redgrave; Mr. H. Trueman Wood; Mr. W. Woodall.

SICK AND AMBULANCE.

*Tuesday, December 18th.*—Present: Director-General Crawford, in the chair; Deputy Surgeon-General Bostock, C.B.; Brigade-Surgeon W. G. Don; Surgeon-Major G. J. H. Evatt; Mr. John Furley; Deputy Inspector-General F. J. Mouat; Director-General John W. Reid; J. C. Steele, M.D.; Mr. H. Trueman Wood.

## OBITUARY.

*M. Lesueur.*—The *Times* Paris Correspondent announces the death of M. Lesueur, the distinguished French architect. Jean Baptiste Cicéron Lesueur, who was born in 1794, at Clairefontaine, near Rambouillet, entered the École des Beaux Arts at seventeen years of age, took the second prize for architecture in 1811, and the grand prize in 1819. After a sojourn of a few years at Rome, he returned to France, and was engaged to construct the parish church at Vincennes. He was also the architect of the Conservatory of Music at Geneva, and of a number of private buildings. In 1846 he was elected an Honorary and Corresponding Member of the Royal Institute of British Architects, of whose Gold Medal he has been a recipient. In the same year he was elected member of the Institute of France, and was shortly afterwards appointed professor at the École des Beaux Arts. M. Lesueur was also known as the author of several books on architecture.

*Mr. Thomas Holloway.*—We regret to announce the death of Mr. Thomas Holloway, which happened on Wednesday last, in his eighty-fourth year. Mr. Holloway will be remembered as the munificent founder of the Sanatorium at Virginia Water and the College for Ladies at Egham, both of which buildings have been illustrated in former volumes of the *Builder*.

## THE HOSPITALS ASSOCIATION.

Under this title an association has been formed, the constitution of which was finally adopted at a meeting held a few days ago at No. 1, Adam-street, Major Ross, M.P., in the chair; and steps were taken for still further enlarging the committee in order to give it as representative a character as possible. The Lord Mayor has shown his sympathy with the movement by placing at the committee's disposal the use of the Egyptian Hall for a meeting to be held in the month of January, when the objects of the proposed association will be brought before the public. Meanwhile, as a result of an inquiry of a wide-spread character, instituted in the metropolis and the provinces, there is now no doubt that the Hospitals Association will shortly be in full working order. Offers of individual help and support are being daily received, and with a fully representative council, the new association will be launched under circumstances which augur well for its future usefulness and success. The objects of the association, as set forth in its constitution, are to be (1) to facilitate the consideration and discussion of matters connected with hospital management, and, where advisable, to take measures to further the decisions arrived at; and (2) to afford opportunities for the acquisition of a knowledge of hospital administration, both lay and medical. It is intended that the association shall afford facilities for the reading, discussion, and publication of approved papers; for the delivery of lectures, and for the holding of conferences on hospital administration, hospital management, medical relief, medical education in relation to hospitals, free and provident dispensaries, and other kindred subjects; and it is to found a library, consisting of works on hospital administration, construction, finance, and statistics.

Mr. J. L. Clifford-Smith has been appointed secretary of the association.

## ARCHITECTURAL SOCIETIES.

*Edinburgh Architectural Association.*—At the fortnightly meeting, held on the 20th inst. in the Professional Hall, 20, George-street, Mr. D. M'Gibbon, president, occupied the chair. Mr. E. Calvert, architect, read a paper entitled "Technical training in the collateral trades a great factor to success," in the course of which he remarked that many youths are apprenticed to the architectural profession through mistaken ideas on the part of their parents, who imagined that their sons were adapted for architects because they had shown a "taste for drawing," forgetting that more than mere drawing was required. He also referred to the large number of youths who completed their apprenticeship without having acquired a thorough knowledge of construction,—being, in fact, little better than copying machines. Had they received some training in the collateral trades they might have developed into useful practical men, instead of swelling the ranks of an overstocked class in the profession. It was to be regretted that no technical schools existed in this country, where students of architecture could be initiated in the technique of those trades so inseparably connected with the profession. The lecturer concluded by advising those who desired to gain this practical knowledge to work side by side with mechanics,—a course which, he said, had been again and again adopted by some of the most distinguished architects, who had considered no post too humble or probation too severe.

*Glasgow Architectural Association.*—The fourth of this session's series of lectures was delivered on the 21st inst., by Mr. Robert Scott, the subject being "Building Contracts." The president, Mr. P. M. Chalmers, occupied the chair. The lecturer urged that greater attention ought to be given to the preparation of both plans and schedules, and every requirement clearly expressed. He then considered in detail the five principal clauses constituting the usual Glasgow building contract, pointing out some common instances of conditions which, he urged, were not only inequitable but also legally untenable. After some discussion, a vote of thanks was awarded Mr. Scott.

## BUILDING PATENT RECORD.*

APPLICATIONS FOR LETTERS PATENT.

5,781. P. M. Justice, London. Compounds for plastering, mortar, &c. (Com. by N. F. Potter, Providence, U.S.A.) Dec. 18, 1883.

5,796. A. Lorrain, Richmond. Apparatus for producing fluid currents for ventilation, &c. Dec. 18, 1883.

5,821. G. M. Morgan, London. Working marble, stone, &c. Dec. 20, 1883.

5,824. A. M. Clark, London. Metallic plastering surfaces. (Com. by J. J. Stanley, New York, U.S.A.) Dec. 20, 1883.

NOTICES TO PROCEED

have been given by the following applicants on the date named:—

*Dec.* 18, 1883.

3,975. J. Templeman, Glasgow. Manufacture of fire-lighters, &c. Aug. 16, 1883.

5,022. F. Parker and W. Parker, London. Hinges, &c. Oct. 22, 1883.

ABRIDGMENTS OF SPECIFICATIONS,

*Published during the week ending December 22, 1883.*

2,129. T. J. Palmer, London. Manufacture of decorative materials for walls. April 27, 1883. Price 2d.

The paper pulp is passed through rollers together with a thick endless blanket which absorbs the moisture and from which this moisture is afterwards expressed. The paper material then passes on to another blanket, and is again pressed, and then passes on to wire cloth, on which it is assed through rolls to be embossed, &c. (*Pro. Pro.*)

2,208. E. R. Palmer, Beckenham. Self-acting flushing apparatus. May 1, 1883. Price 2d.

A syphon is placed in a tank and a ball-valve is so fitted that when the tank is empty the water passes in very slowly, but as the water raises the ball-valve, the inrush of water increases until it fills the syphon and the tank is emptied. (*Pro. Pro.*)

2,293. H. J. Haddan, London. Compound for rendering textile fabrics, wood, &c., fireproof. (Com. by S. Gimeney and J. Yrigoyen, Pamplona, Spain.) 5th May, 1883. Price 2d.

This consists of the bark of iron wood steeped in water, and mixed with sea-salt. To this water is then added sulphate of zinc, alum, sal ammoniac, and fish glue, and the whole is well stirred together and heated, when it is allowed to cool, and is ready for use. (*Pro. Pro.*)

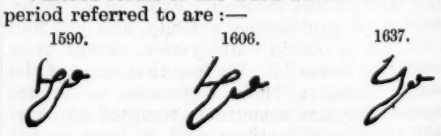
## "THE" AND "YE."

Sir,—During the course of transcribing "a Booke of Register whearin are conteyned the names of those w$^{ch}$ have beene Christined wedded and buried w$^{thin}$ the pishe of Wilton ffrom the yeare of our Lorde God 1558 unto the yeare that nowe is 1590 and so folowinge continualy," I was struck with the way in which the definite article, or, as I believe it is now more correctly termed, distinguishing adjective, was written, as not bearing out the popular notion that our ancestors wrote "ye" when they meant "the."

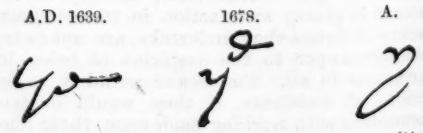
Although the entries begin with the year 1558, it is evident that those for the first thirty-two years were copied in 1590 from an earlier document. The register is continued to the year 1714; it is, therefore, to the period of 124 years between these two last-mentioned dates that my observation has been confined.

Various forms of the word which occur in the period referred to are:—

1590. 1606. 1637.



A.D. 1639. 1678. A.



They show that originally the word was written with three clearly defined letters t-h-e; that afterwards, as in 1637, when carelessly written, the peculiar down-stroke which formed the "h" had certainly in connexion with the "t" the appearance of being intended for "y," but that such was not the case is evident from an

* Compiled by Hart & Co., Patent Agents, 186, Fleet-street.

examination of the "y" of the same year which is of the form shown at A; and that later, when the "th" and "y" more closely resembled each other, the third letter "e" was written above the other two, apparently to show that "th," or an abbreviation equivalent thereto, was intended, and not "y."

The gradual transition in the original document is very interesting to notice, and seems to show that the interchange of these two parts of speech, which is so often affected in the present day when adopting the phraseology of an older period, is not borne out by this contemporary manuscript. J. HOUGHTON SPENCER.

## ELM BLOCK FLOORS.

SIR,—I am inclined to think Mr. White, in his letter on page 842, seems to attach undue importance to the thickness of 2½ in. for the blocks. Cases have been mentioned to me in which 1½-inch blocks have been used without any trouble from turning up, although some were rendered loose by a large amount of shrinkage.

I believe much care was exercised in preparing the bed for the blocks, a layer of rough asphalte was put upon concrete and then a layer of cement, and the blocks were dipped in Stockholm tar. Can it be that the shrinkage of elm does not cease till after a long time of exposure? It would be desirable to put down the elm blocks hot from the drying-room and try the effect in some space near a fire, or where there would be a considerable change in temperature. W.

## *RE* PARTY WALLS.

SIR,—It will, I think, be a benefit to the profession generally if Mr. Lee will state on what authority or decision he bases his remarks in your last issue [p. 842].

Unless specially mentioned as otherwise in the leases or covenants, I understand that a party wall is held in undivided moieties by the adjoining owners, and, therefore, neither party can say that one particular half of the wall is his own property.

And, further, Clause I., Sec. 85, Part 3, of the Building Act as applied to Sec. 83 of the same part, seems to refer to party walls generally, however held. J. BROOKES HUNT.

## LIGHT CASES.

RUSSELL *v.* WATTS.

JUDGMENT was delivered on the 21st inst., on this appeal from a decision of Vice-Chancellor Bacon, which was argued in the course of last month. The parties occupied portions of a building originally erected in Liverpool by Mr. J. R. Jeffery, and known as Compton House. He had intended to erect one large building on the whole of the site for the purposes of his business, but was compelled by the insurance companies to alter this, and to erect seven blocks which communicated with each other, and could be occupied as one building. Some of the rooms in the blocks were lighted by means of windows looking upon deep-well holes or shafts covered with skylights.* The blocks were described as A, B, C, D, E, F, and G. The buildings were mortgaged to different individuals, and, since Jeffery's failure, had been in the possession of different individuals. The plaintiff was now in possession of block B, and he defendants of Block C. The plaintiff's premises were in part lighted by windows which opened on a well-hole situate on the defendants' premises, and the defendants, in May, 1880, blocked up their windows by nailing boards over them, and afterwards by tarring them over. The action was brought to restrain the defendants from committing acts of trespass, and also to restrain any obstruction of the plaintiff's light derived through the windows in question. The Vice-Chancellor granted an injunction, and the defendants appealed.

Lord Justice Cotton said (we quote from the report in the *Times*) the question was whether there was any implied reservation of an easement of light when the grant was made by Jeffery in June, 1866, to the defendants' predecessors in title. There was an enormous difference between a grant and an implied reservation. As a general rule, a man could not derogate from his own grant. As regarded a reservation, the matter stood in an entirely different position. The object of an implied reservation was to derogate from the grant, to render it less beneficial to the grantee. These were, no doubt, exceptions to the general rule, as in the case of an essential easement, such as an easement of mutual support of two houses, or the case of a way of necessity, as if a man sold the land surrounding a field which he did not sell. It would be assumed that he intended to use that field, and a way of necessity to it was said to be reserved by implication. There was also another case, which was not really an exception; when several grants were made by the same grantor, not actually contemporaneously, but so as to form really one transaction, then each grantee was held to have the benefit of an implied grant or reservation of those easements which were really necessary to the enjoyment of the property granted to him. His Lordship was of opinion that there was nothing in the mortgage to Messrs. Moon to lead to an inference that it was intended there should be any reservation, nor did he think that any reservation was to be implied from the circumstances. He was also of opinion that there was nothing to justify the conclusion of the Vice-Chancellor. The defendant Duckworth had done nothing to interfere with the plaintiff, and ought not to have been made a defendant, and as against him the action must be dismissed with costs. There would be no costs of the appeal.

Lord Justice Lindley differed. He said that the case was not that of a vendor of a piece of land attempting to derogate from his own grant. It was more like the case of several persons interested in several pieces of land all agreeing to build upon them in a particnlar way so as to accommodate one another, and of one of them afterwards, when the buildings are up, insisting on rights which were quite incohsistent with the enjoyment of the buildings as erected. There was no authority to show that in such a case any one of such persons could afterwards build on his own land so as to obstruct his neighbour's light, and in the absence of such authority he was of opinion that he could not do so. In such a case, it appeared to his Lordship that the cross easements which were created in the first instance were impliedly granted in equity, if not at law, and, if such easements were apparent, no purchaser could protect himself against them by alleging that he bought without notice of them. So far as the defendant Watts was concerned, his Lordship was of opinion that the decision of the Vice-Chancellor was correct, and that the appeal ought to be dismissed.

Lord Justice Fry concurred with Lord Justice Cotton. The Vice-Chancellor had characterised the conduct of the defendant Watts in blocking up the plaintiff's windows as "brutal," and his Lordship did not differ from that view, and he thought that the defendants ought to have no costs of the appeal.

* A very unhealthy system.—ED.

## CASE UNDER THE EMPLOYERS' LIABILITY ACT.

HILL *v.* SCOTT.

IN the Queen's Bench Division of the High Court of Justice on the 17th inst., this case came before Mr. Justice Mathew, Mr. Justice Day, and Mr. Justice Smith, sitting as a divisional court, on appeal from the Huddersfield County-court. Mr. M'Intyre was counsel for the appellant; Mr. Gainsford Bruce for the respondent.

The case was brought, under the Employers' Liability Act, in the Huddersfield County-court, before the Judge, sitting with a jury, to recover damages for the death of the plaintiff's husband, who was killed through the falling of a "jib" of a crane belonging to the defendant (the appellant in the present case), a contractor; and the jury returned a verdict for the widow, with 135*l.* damages. The negligence complained of was that the crane was improperly constructed, and with a defect. The defendant in the course of his business had contracted to do certain excavating work, and the crane was his property. The jib had fallen down two or three days before the accident, and had been replaced by the appellant's men. The deceased was in the appellant's employment as a brakesman, but at the time when he met his death he was lending a hand to the men of a sub-contractor named Stafford, who were at work on the same ground building a wall. A rule for a new trial has been granted on the following grounds: 1. That there was no evidence to show that the deceased had ever the right or duty to be where he was; that he was at most a bare licensee, and that the defendant had no duty at the time towards the deceased to provide a proper crane. 2. That there was no evidence to show that the crane was connected with or used in the business of the defendant.

Mr. Gainsford Bruce, for the respondent, argued that the deceased did not cease to be a workman in Scott's employment because he happened to go a few steps beyond the spot where his particular duty led him. The appellant (Scott) was standing by at the time of the accident, and neither he nor any one else sought to prevent the deceased from rendering assistance.

Mr. M'Intyre pointed out, on behalf of the appellant, that the deceased was in Scott's employment, and that Scott had entered into a sub-contract with Stafford to build a wall; that by the terms of the sub-contract Scott was to bring the stone used in the erection of the wall down to the crane, and that Stafford, by his men, was to unload the stone. Part of the unloading consisted in attaching the chain from the crane to the stone, and it was while he was doing this that the deceased was killed. The learned counsel contended that if the deceased had been Stafford's servant he might have had a right of action against Scott, but that as Scott's servant he had no business at the spot.

Mr. Justice Mathew.—If Stafford's men had been employed, and one of them had been killed, there would have been an action against the defendant. Why is Scott in a different position because this man happens to have been in his own employment? The case is complete against the defendant, because he must have contemplated that somebody should do the work. Scott had an interest in the expeditious execution of the work; he was present, and did not interfere.

After some further argument, their Lordships unanimously discharged the rule.

## PROVINCIAL NEWS.

*Hull.*—On the 11th inst. the old Grammar School, Hull, which has been restored by Messrs. Smith & Brodrick, architects, and converted into a mission-room in connexion with Holy Trinity Church, was opened by his Grace the Archbishop of York. On the motion of the Mayor, a resolution was passed expressing the satisfaction of the meeting at the preservation of the picturesque old building. The Mayor stated that the school was just four centuries old, having been founded in 1486. Its founder, John Allcock, was a merchant, and had filled nearly every municipal office. He held three bishoprics in succession, and became ultimately Lord Chancellor of England. Alderman Gee, who in the sixteenth century served three times as Mayor, was the restorer of the school, having given 80*l.* and 80,000 bricks for the purpose, and also some bequests. At that time a new school was built to the westward of the old one, which was thereafter used as the master's residence. The Corporation was said to have added a second story, which was used by day as an Exchange, and at night as an Assembly-rooms, our merchants having thus learned to combine business with pleasure. He had the authority of Mr. McCormick for saying that Henry VIII. danced in this room; but, unfortunately, Mr. McCormick and chronology were at variance, for the Assembly-rooms were built in 1585, while Henry VIII. died, if he remembered rightly, in 1547. The building has been preserved and converted to its present use at the suggestion of the Vicar.

*Birmingham.*—A new building for business purposes, situated in Ernest-street, Holloway Head, Birmingham, is now approaching completion. The structure consists of a merchant's warehouses, offices, strong-room, covered yards, &c. The various rooms are conveniently arranged, and lofty, and a considerable portion of the building is covered over with rolled plate glass. The lift and strong room fittings have been supplied by Messrs. Clark, Bunnett, & Co. The offices are approached by a wide stone staircase and landing. The front elevation is in the Early Gothic style, with rubbed and gauged arches, ornamental red brick cornices and strings, stone labels, lintels and tympana, polished red granite column, carved bosses, &c. Over the gateway entrance is an ornamental iron grille. This building has been erected for Messrs. Wallace & Co., merchants, Birmingham, by Mr. Thomas Hughes, builder, Baker-street, Smallheath, from plans, &c., prepared by Mr. John Statham Davis, architect, Birmingham. The total cost approaches 2,000*l.*

*Walsall.*—Extensive alterations to the skating-rink here have just been completed for "General" Booth, at a cost of 400*l.*, the same having been converted into "barracks" buildings by the Salvation Army staff, Mr. George Brick acting as clerk of the works under the superintence of Mr. E. J. Sherwood, architect.

*Basingstoke.* — On the 20th inst., Messrs. Raynbird & Sons, of this town, held a large and important sale of valuable freehold building land at "The Red Lion" Hotel. The first lots offered were two plots in Chapel-street, having extensive frontages to the Junction-road. The biddings for these lots were slow, but they were eventually sold at about 3*l.* per foot frontage. Lot 3 comprised the premises situate in Wote-street, occupied by Mr. C. F. Cooksey. This lot, with a frontage of 99 ft. and a depth of 115 ft., was sold for 800*l.* Lots 4 to 9, situate at the south end of the town, and known as the "Hackwood-road Nurseries," containing about 2a. 0r. 15p. were offered together, and after some spirited bidding the whole were purchased by Mr. A. Deards, builder, London, for 1,840*l.* Lots 10 to 25 were situate in the parish of Eastrop, adjoining the town; they were known as "Chequers' Close," and arranged in convenient lots to suit purchasers, with frontages ranging from 50 to 150 ft. The biddings for these lots were slow, but nearly all were disposed of at good prices amounting to about 2*l.* per foot frontage and over 600*l.* per acre.

## STAINED GLASS.

*Rochester.*—The ceremony of unveiling three memorial windows to the officers, non-commissioned officers, and men of the corps of Royal Engineers who were killed in action or died from disease in the South African campaigns of 1878-81, Afghan campaigns of 1878-80, and the Waziri expedition of 1881 was on the 19th inst. performed by Field-Marshal Lord Napier of Magdala in Rochester Cathedral. No fewer than nine memorial windows had been previously placed in the cathedral to the memory of distinguished Royal Engineer officers, and the present ceremony related to three additional ones,—viz., the great west window of the cathedral, 30 ft. by 20 ft., in commemoration of the whole of the officers and men who fell in the various expeditions, and two smaller windows, one on each side of the larger one, dedicated to the memory of Colonel A. W. Durnford and Lieut. R. T. Henn respectively; to the former "for bravely fighting to the last and dying with his faithful followers in the gap, endeavouring to cover the retreat on the fatal day of Isandhlwana," and to the latter officer "for gallantly struggling to the end and dying with his native sappers and some members of the 66th Regiment, the last left on the field of Maiwand, in Afghanistan." The subjects chosen for illustration by Messrs. Clayton & Bell, by whom the window has been executed, are all taken from the sacred writings,—chiefly Old Testament history,—some two hundred of the principal Biblical characters and events being introduced. The whole is surmounted by a representation of the Star of India, with grenades, &c., near which are depicted the rose, thistle, leek, and shamrock. In the centre are the Royal arms, flanked by figures of St. George, St. Patrick, St. David, and St. Andrew. The names of the whole of the officers and men are inscribed on brasses.

*Northfleet.*—A stained-glass window has been placed in this church representing the subject of the Presentation in the Temple. The work is by Messrs. Warrington & Co., of Fitzroy-square.

## VARIORUM.

"London Cries," sent to us by Messrs. Field & Tuer, is a volume on the subject of old London street cries (which are more attractive in their historical past than in their real present), which derives its chief value, as the author admits, from its illustrations. These include reproductions of some very pretty pictures of children, "six charming children," carrying on various trades in street merchandise, originally published in 1812 by S. & J. Fuller, at "The Temple of Fancy, Rathbone-place." There are also some reproductions of small coloured plates by Rowlandson, illustrating the same subject.——"English Etchings," Part XXXI. (issued by W. M. Reeves) contains three plates,—"Dryden's House in Fetter-lane," by Mr. Percy Thomas; "The Farmer's Boy," a subject from Bloomfield's now nearly-forgotten poem, by Mr. A. M. Williams; and "The Yew Tree's Shade," by Mr. H. Pope. The latter is the most powerful in effect, and represents best the special powers of etching as a form of artistic expression; "The Farmer's Boy" is one of the engraving-etchings, as one may call them, very delicately worked, but wanting in the vigour and freedom in which etching has the advantage over engraving. The three are issued in one cover for a price which is remarkably low (3s. 6d.) for such good art as this, and we join in the wish, expressed in a quotation from a contemporary, that the "lower middle class," if they want cheap pictures, would take such work as this rather than the horrid things in the way of oleographs and chromo-lithographs which they are often content to frame.——"Painting on China," with twelve descriptive lessons, by Mrs. Conyers Morrell (Kennedy & Brown), is a useful and very compact little manual for those who wish to amuse themselves with this pretty and attractive form of artistic work.——The *Leisure Hour* for January contains some good and some poor illustrations; among the former a coloured print after Mr. Caldecott, "The Professor's Class."——The *Boys' Own Paper* and *Girls' Own* ditto, published at the *Leisure Hour* Office, are very spirited and liberal in their illustrations, for sixpenny publications of such extent.——Among publications rather useful than ornamental we have "Book-keeping in accordance with the Bankruptcy Act," by Mr. Henry Feast (Feast & Hole); "The Artisans' Year Book," Simpkin, Marshall, & Co.; "The Railway Diary and Officials Directory," McCorquodale & Co.; and "The Diary for 1884," published in connexion with the *Sanitary Record* and the *London Medical Record*. —— The *Journal of Progress* in Wood-working appears to be really a kind of illustrated *catalogue raisonné*, issued by Messrs. Goodell & Waters, of Philadelphia, builders of wood-working machinery; it contains some carefully-executed illustrations of machinery. ——Calvert's "Mechanic's Almanac" intersperses a good deal of useful information among its tables.

## Miscellanea.

**The Disease of the Money-Counters.**—A Washington correspondent, says the *London Medical Record*, visiting the Treasury Department, noticed that many of the women employed in counting bank-notes looked ill, and had sores upon their hands or heads. The superintendent gave the following account of the trouble:—"Very few," he said, "who spend any considerable time in counting money escape the sores. They generally appear first on their hands, but frequently they break out on the head, and sometimes the eyes are affected. We can do nothing to prevent this. All of the ladies take the greatest care of themselves in their work, but sooner or later they are afflicted with sores. The direct cause of the sores is the arsenic employed in the manufacture of the money. If the skin is the least abraded, and the arsenic gets under the flesh, a sore will appear the next morning. The habit that every one has of putting the hand to the head and face is the way the arsenic-poisoning is carried to those portions of the body. 'See here,' said one of the officials, stopping by the side of a young lady, and picking up a glass vessel containing a sponge, 'this sponge is wet, and is used to moisten the fingers while counting the money. You see how black it is. That's arsenic. Every morning a new piece of sponge is placed on the desk of each *employée*, but before the day is over it is as black as this. I have known half a dozen cases where ladies have been compelled to resign their positions. There are three ladies who were here six years before they were afflicted with sores. About three months ago they were so visited by them that they had to quit work. They have been away ever since, and the physician's certificate in each case says that their blood is poisoned with arsenic.'"

**The Hampstead and Fulham Hospitals Litigation.**—It is stated that the Metropolitan Asylums Board and the litigants at Hampstead and Fulham have come to terms, by which the inhabitants of London will be spared the expense of further litigation in the matter of the hospitals for fever and smallpox at Hampstead and Fulham. The Fulham case is to be closed by the payment of damages proved to the amount of 6,000*l.*, and the hospital will remain where it is. The case of the hospital at Hampstead will be a good deal more costly. After protracted negotiations between the Asylums Board and Mr. Pearson Hill, the Board offered to purchase the property adjoining the hospital at a price to be settled by negotiation. Mr. Hill at first demanded 31,500*l.*, and the Board offered 15,000*l.*, but at last both parties agreed on the intermediate term of 22,500*l.* For this sum Mr. Hill's claims for costs and damages will be satisfied, and his property, consisting of two houses and upwards of three acres of land, will be transferred to the Board. A new and convenient access to the hospital will also be obtained under the same arrangement.

**Church Decoration, Loughborough.**—Some decorative panels have just been added to the east wall of All Saints' Church, Loughborough, Leicestershire, one on each side of the window and one on each side of the reredos. The panels have been painted by Miss Agnes Saunders, lately a student at the School of Art, South Kensington. The two upper panels contain life-sized figures of the four Evangelists, who point to the figure of the Saviour in the window. The lower panels are filled with a conventional design, to accord with the centre portion of the reredos. The material employed is the same as was used in painting the wooden ceiling of Ely Cathedral. The work is a gift from Archdeacon Fearon to the church.

**Mortuaries for the Metropolis.**—Whatever differences of opinion may exist as to the most promising remedy for the overcrowding of the poor, now attracting so much public attention, there can be none as to the urgent and pressing need of increased mortuary accommodation. An inquiry made some time ago revealed the startling fact that in the great majority of metropolitan sanitary districts there was no mortuary accommodation at all, and where it does exist it is commonly administered on the narrowest parochial principles. Thus, at the conclusion of an inquest held a short time ago on the body of a lad who had lost his life by the overbalancing of a boat, the coroner's officer stated that having found the body in the parish of Aldgate, where the mortuary has been demolished by the Metropolitan Board of Works, he carried it to the adjoining parish of Wapping. Here he experienced great difficulty in placing it; and the mortuary keeper told him that he would not in future receive any bodies from without his parish. In answer to the officer's application to know how to proceed in future cases, the coroner stated that what he had just heard was a great public scandal, which ought not to be allowed to exist. It was the duty of the parish officers to provide a resting-place for the bodies of those found dead, and he directed his officer, should such a case arise again, to take the body to the house of one of the churchwardens, and, failing that, to the police-station.—*The Sanitary Record.*

**Meteorology.**—The third of a course of lectures on "Meteorology," by Mr. W. Marriott, F.R.M.S., was delivered on the evening of the 20th of December, in the reading-room of the Society of Engineers, Victoria-street, Westminster, Mr. A. T. Walmisley, member of council, in the chair. This lecture was devoted to the consideration of atmospheric pressure. Having referred to Torricelli's experiment proving that a column of water 32 ft., or of mercury 30 in., is in equilibrium with the pressure of the atmosphere, the lecturer explained the construction of the barometer, and described the Fortin, Kew, siphon, aneroid, and other forms of this instrument. As the pressure decreased with altitude, it was shown how the barometer could be used for the measurement of heights. It was pointed out that there is a diurnal range of atmospheric pressure, which consists of two minima about 4 a.m. and 4 p.m., and two maxima at about 10 a.m. and 10 p.m. This phenomenon is most marked in the tropics. Having referred to the connexion existing between the changes of atmospheric pressure and the flow of underground water, and also colliery explosions, the lecturer explained the construction of isobaric charts, and by the aid of such charts showed the distribution of pressure over the globe during the months of January and July.

**Ventilation of the Hospital Ship "Castalia."**—The Local Government Board have approved the adoption by the Metropolitan Asylums Board of Messrs. Robert Boyle & Son's Patent Self-acting Air Pump Ventilators for the ventilation of the twin-ship *Castalia*, which, having been acquired by the Board, is being converted into a Small-pox Hospital. We understand that this is one of the largest ventilating contracts that Messrs. Boyle have yet undertaken, there being twenty air-pump ventilators 6 ft. in diameter, and sixteen 3 ft. in diameter, included in their contract, which embraces all the necessary shafting, fixing, &c., &c. When the work is finished, owing to the elaborate and complete nature of the arrangements it is expected to be one of the most unique examples of ventilation. The Air-Pump ventilators are also being applied to the transport steamers attached to the *Castalia*.

**Cremation.**—The great difficulty about cremation and the principal obstacle to its general adoption is the danger of affording facilities for the commission of murder by poison. Would it not be possible to organise a system of post-mortem examinations in every case of intended cremation so as to get rid of the difficulty? Beyond question it would be a good social policy, so far as health is concerned, to burn bodies instead of burying them; but it will not be possible to adopt cremation as a general practice until society has safeguards against the terrible danger to life which cremation undoubtedly creates. Such hideous crimes as those committed by Smethurst, Pritchard, and other notorious poisoners would never have been discovered if cremation had been in vogue.—*The Lancet.*

**The Artisans and Labourers' Dwellings Acts.**—By order of the Court of Common Council, a return has been published showing the steps taken by the Corporation and the City Commissioners of Sewers to provide improved dwellings for the labouring poor. From this return it appears that the Corporation of London first directed their attention to the subject in the year 1851. In that year the Improvement Committee of the Court of Common Council acquired and cleared ground suited for labourers' dwellings, at an expense in all of 30,519*l*. Estimates of the cost of the erection of the buildings were prepared, but the ground acquired by the Court was taken compulsorily under the Act of Parliament for constructing the Metropolitan Railway, and delay consequently resulted. Ground was then acquired in the neighbourhood of the Farringdon-road, and a contract was entered into in the year 1869 for the erection of four blocks of buildings, to be called "Corporation Buildings," at a cost, including the site, of 54,568*l*. Additions were subsequently made, raising the total cost to 59,783*l*. These blocks accommodate 846 persons. The Corporation in the years 1866-7 further appropriated two buildings, designed for hotels, at the Metropolitan Cattle Market at Islington, and adapted them for lodging-houses for the artisan class, at a cost, including the estimated value of the site, of 33,000*l*. In these buildings 160 persons are accommodated. Under the Acts for making the Holborn Valley Improvements, the Corporation subsequently obtained powers facilitating the acquisition of land on which to erect dwellings for the poor. The amount expended under these Acts in the provision of the dwellings, termed "Viaduct Buildings," including the value of the site, has been 13,023*l*., and the number of persons accommodated is 585. The figures here given exhibit a great disproportion between the cost of the results obtained, the probable explanation being that the buildings near the Cattle Market were built for other purposes.

**Building on Burial Grounds.**—The proposal to build over the disused burial-ground in Peel-grove, Bethnal-green (alluded to in the *Builder* a few months ago), does not seem to have been abandoned, notwithstanding statements made to that effect at the time. The posal having been again revived, Lord Brabazon, Chairman of the Metropolitan Public Gardens and Playgrounds Association, has written asking the Metropolitan Board of Works to oppose the scheme, saying that even if the whole surface of the ground were concreted over, subsidences would certainly take place from time to time, creating fissures in the concrete, so that not only would the stability of the houses be endangered, but noxious emanations would arise from the human remains below. (The number of persons buried in the ground is given as 20,000.) It is satisfactory to note that at the meeting of the Metropolitan Board of Works on the 21st inst. Mr. Shepherd, Chairman of the Building Act Committee, stated that the Building Acts authorised the Board to take proceedings in the event of building operations being commenced, and the committee had instructed the solicitor to take proceedings when the occasion arose. He moved "That Lord Brabazon be informed that the Board have refused their consent to an application made by the parties in July last, and that they have taken, and are taking, steps to prevent buildings being erected upon the site." Mr. Ewen (representing the parish of Bethnal-green) said that the local authorities had given instructions for the ground to be watched, so that immediate action might be taken in the event of any building operations being commenced. Mr. Selway stated that under an Act obtained in 1878, the Board had full powers to deal with a case of this kind, but, as the chairman of the committee had explained, nothing could be done until building operations were commenced.

**New Patent Law.**—This law will come into operation on January 1, 1884. Under the new regulations Provisional Protection, which will give absolute security to an invention, will cost four guineas. The next and last step will consist in filing the complete specification, which may be done at any time afterwards within nine months. This will cost nine guineas, exclusive of drawings, if any, and when the specification is not extremely long and elaborate. The patent, when issued, lasts for four years without further payment, instead of three years, as at present.

**Artisans' Dwellings in the City.**—At the meeting of the City Commission of Sewers on the 18th inst. a letter received from Messrs. Ashby & Horner, the well-known firm of builders, asking the Commission to endeavour to procure an alteration of the law under which blocks of dwellings for the poor, constructed by private individuals, were liable to house-tax, was referred to a committee for consideration. A request from the Home Secretary to be informed when the contract for the erection of artisans' dwellings on the Petticoat-square site was made, and at what date the buildings were to be completed, was referred to the clerk to answer. Dr. Sedgwick Saunders, the medical officer of health, urged the Court to reconsider that portion of the plans for the artisans' dwellings about to be erected in Petticoat-square which had reference to the height of the rooms. By the sectional drawings, that was shown to be 8 ft. only in all the rooms above the ground floor. In his opinion that was totally inadequate to the requirements of the people intended to be benefited by those dwellings. He desired to place on record that the dimensions, appliances, and ventilation of the rooms, and other kindred matters, had never in any shape or form been submitted to him as the medical officer. The report was referred to the Finance and Improvements Committee for consideration.

**Brentford Drainage.**—The new works for the drainage and disposal of the sewage of Brentford have just been inspected and formally opened by the Local Board, the ceremony of starting the engines being performed by Mr. T. Layton, F.S.A., the chairman of the Board. The sewage is pumped from the collecting-well at the Town Meadow to the sewage-tanks at Ealing, a distance of about a mile. The sewage is deodorised and precipitated by the mixture of lime and sulphate of alumina, and the effluent water discharged into the river by a culvert along the line of Clayponds-lane. The sludge is dried by means of flues constructed under the tanks, and is run out by a small tramway. The Local Board have obtained a loan of 30,000*l*. to carry out these improvements. The works have been designed by Messrs. Gotto & Beesley, engineers, of Westminster, and have been carried out by Messrs. Ford & Everett, as contractors for the general works, the Staveley Coal and Iron Company supplying the iron pipes, and Messrs. James Watt & Co. the engines and machinery. The work has been superintended by Mr. Lacy, the town surveyor.

**Birkenhead School of Art.**—We received a week or two back the report of the able head master of this school, Mr. Bentley, from the general terms of which we gather that while attendances, for what is now a large and populous neighbourhood, are less numerous than might have been wished or expected, the average quantity of work done is good, and improving. Among other points we notice a considerable proportion of competitors for prizes for drawing from memory, a branch of artistic training which, to our thinking, should be assiduously cultivated. The principle of never drawing but with the object or model before the eye may be carried too far, with the result of making student or artist too exclusively dependent upon it. We give elsewhere an extract from an address which was delivered by Mr. Walter Smith, on the occasion of giving the prizes to the students.

**Death from Sewer Exhalations.**—A painful warning occurred last week of the danger arising from open sewer-ventilators in the public road. Police-constable Hillsden, a tall, stout, robust young man, had been placed on fixed duty at Waddon, near one of the open gratings in the road, and it is supposed he inhaled the escaping gas, and being taken ill he was removed to the Croydon Infirmary, where he died of typhoid fever, followed by pleuro-pneumonia, after six weeks' acute suffering.

**The Manchester Ship Canal Bill** has been deposited in due form in the Private Bill Office of the House of Commons. The capital is set down at 8,000,000*l*., and, as far as possible, last year's Bill has been improved upon from the promoters' point of view. The Pomona Gardens are to be acquired to divert the canal aqueduct at Barton. The railway diversions at Warrington and Irlam are to be minimised, and the course of the canal at Walton will be altered.

**A Brass Eagle Lectern** has ust been supplied to Alderwasley Church by Messrs. Jones & Willis.

**Sanitary Condition of the Inner Temple.** A report has reached us of a case of typhoid fever in the Inner Temple, and since the conditions of life in the sets of chambers there are somewhat peculiar, a word of caution may not be inopportune. A word of caution seems the more necessary as, doubtless, many of the sanitary fittings are of an archaic type, or, perhaps, modern fittings have been put into dwellings which were never designed for their reception. With common soil-pipes running through every floor of a building, with the waste-pipes of cisterns and lavatories communicating directly with these common soil-pipes, and, possibly, with a common supply of water for drinking and for closet flushing, it is evident that the fellow-lodgers of a case of typhoid would run some considerable risk, and we trust the Benchers will take the sanitary condition of their property into serious consideration.—*The Lancet.*

**Wakefield Industrial and Fine Art Institution.**—The report of this institution, submitted at the sixteenth annual public meeting and prize distribution, a few days ago, mentions the increasing number of artisan students, and a growing desire on their part to take up advanced subjects. Mr. John Binks moved the adoption of the report, and the motion was seconded by Mr. James Fowler, F.S.A., architect, of Louth, who said that considering the short time the School of Art had been in existence they could not help congratulating themselves upon the firm root it had taken in the town, and the scope it was able to propose to itself—the number of subjects taught. Mr. Fowler concluded by testifying to the courtesy and kindness, as well as efficiency, with which Mr. Swire, the head-master, fulfilled his duties. Mr. Walter Smith, whose address to the Birkenhead students we have given in part in another column, was also called on to address them at Wakefield.

**Royal Institute of British Architects.**—We are glad to note that a circular has been issued to members giving a notice of a proposed alteration in By-laws xxvi. and xxvii., the result of which, if adopted, will be to abrogate the principle of successive election to the presidential chair by seniority of Vice-presidents, and to rule that "any Fellow a Honorary Fellow shall be eligible to be nominated by the Council as President." We predicted from the first that the seniority arrangement would not work, and we hope the alteration will be carried unanimously, and the Institute e nabled to adopt at once the only right system for their best interests—viz., the election successively to the chair of the best representatives of the profession who may be eligible, and be willing to accept office.

**Edinburgh Operative Masons.**—A meeting of the Edinburgh operative masons was held in their hall, High-street, a few days ago, to consider the intimation from the employers of a halfpenny reduction per hour. After several of the men had expressed their opinion in rather strong terms at the action taken by the employers, the following resolution was carried by a majority:—"That, in the opinion of those present, the employers have at the present time taken an undue advantage,—in fact, virtually broken faith with the operatives,—in reducing the wages a halfpenny per hour; we therefore, in the meantime, accept the reduction under protest."

**Exeter.**—A handsome addition is about to be made to the Church of St. Michael and All Angels, Exeter, in the shape of a carved oak pulpit, in place of the present temporary one. It is the gift of Mrs. Gibbs, of Tyntesfield, and has been designed by Mr. Arthur W. Blomfield, M.A. The execution of the work has been entrusted to Mr. Harry Hems.

**Longridge, Preston.**—A new Wesleyan Chapel and Class-rooms are about to be erected from the plans and designs of Mr. David Grant architect, Preston.

## TENDERS.

For new warehouse in London-wall. Mr. W. E. Brown architect, 6, Poultry:—

| | | | |
|---|---|---|---|
| Adamson & Sons | £4,740 | 0 | 0 |
| Mark | 4,674 | 0 | 0 |
| Brass | 4,565 | 0 | 0 |
| Scrivener | 4,542 | 0 | 0 |
| Bass | 4,500 | 0 | 0 |
| Lawrence & Sons | 4,487 | 0 | 0 |
| Greenwood | 4,442 | 0 | 0 |
| Nightingale | 4,381 | 0 | 0 |
| Patman & Fotheringham | 4,373 | 0 | 0 |
| Boyce | 4,373 | 0 | 0 |
| Conder | 4,285 | 0 | 0 |
| Richardson | 4,269 | 0 | 0 |

For the erection and completion of divisional head-quarters, comprising stores, book rooms, council chamber, and offices, at Constitution-hill, Birmingham, for the Salvation Army. Mr. E. J. Sherwood, architect, 101, Queen Victoria-street, E.C. Quantities supplied:—

| | | | |
|---|---|---|---|
| W. J. Whittall, Lancaster-street, Birmingham | £1,198 | 0 | 0 |
| John Webb, Wells-street, Birmingham | 1,144 | 0 | 0 |
| Messrs. Bissett & Son, Sheffield | 1,090 | 0 | 0 |
| Wm. Smith, Key Hill, Birmingham | 1,076 | 0 | 0 |

For the erection and completion of Salvation Army barracks, for General Booth, in Beresford-street, Woolwich. Mr. E. J. Sherwood, architect. Quantities supplied:—

| | | | |
|---|---|---|---|
| H. Coombes, Plumstead, Kent | £1,476 | 17 | 7 |
| Dunford & Griffin, Poole and Wimborne | 1,384 | 0 | 0 |
| Wm. Harris, Greens End, Woolwich | 1,325 | 0 | 0 |
| John Brightmore, High-street, North Woolwich | 1,300 | 0 | 0 |
| R. Foster, Springfield-terrace | 1,282 | 0 | 0 |

For the erection of ten houses in Tournay-road, Walham Green, for the Middlesex Land Company, Limited. Mr. George Edwards, architect, 68, Brompton-road:—

| | | | |
|---|---|---|---|
| Reading | £4,940 | 0 | 0 |
| Green | 4,759 | 0 | 0 |
| Colls | 4,455 | 0 | 0 |
| Hunt | 4,450 | 0 | 0 |
| Scharien & Williams | 4,430 | 0 | 0 |
| Long (accepted) | 4,388 | 0 | 0 |

For the erection of outbuildings, consisting of mortuary, laundry, coal-house, ambulance, and living rooms, for the Cottage Hospital at St. Paul's Cray, Kent. Mr. St. Pierre Harris, architect and surveyor:—

| | | | |
|---|---|---|---|
| Otway | £257 | 13 | 0 |
| Treadwell | 223 | 0 | 0 |
| Wood (accepted) | 191 | 0 | 0 |

For alterations to house, King's-road, Chelsea. Mr W. E. Brown, architect, 6, Poultry:—

| | | | |
|---|---|---|---|
| King | £232 | 10 | 0 |
| Hudson | 195 | 0 | 0 |
| Holliday & Greenwood | 188 | 0 | 0 |
| Adamson & Sons | 180 | 0 | 0 |

For building new club-room, exclusive of fittings, at the Refiners' Arms, Buross-street, Commercial-road, E., for Mr. J. W. Connor:—

| | | | |
|---|---|---|---|
| Moyle & Son (accepted) | £212 | 0 | 0 |

[No competition.]

For rebuilding house, No. 210, Mile End-road, for Mr. W. B. Press. Mr. C. A. Legg, architect, Mile End:—

| | | | |
|---|---|---|---|
| F. & F. J. Wood | £635 | 0 | 0 |
| Lusk | 600 | 0 | 0 |
| Poole & Co. | 555 | 0 | 0 |
| Russell | 550 | 0 | 0 |
| Walker | 522 | 0 | 0 |
| Hearle & Son | 515 | 0 | 0 |
| Palmer & Son | 455 | 0 | 0 |

For the construction of main sewerage works at Tillingham, Essex, for the Maldon Union Rural Sanitary Authority. Mr. Alfred B. Brady, A.-M. Inst. C. E. surveyor. Quantities supplied:—

| | | | |
|---|---|---|---|
| G. W. Beaton, Hunstanton St. Edmunds | £1,112 | 10 | 0 |
| Wise & Wilson, Manor Park | 984 | 5 | 1 |
| Beadle Bros., Erith | 979 | 0 | 0 |
| G. Cowdery & Sons, New-cut | 973 | 4 | 4 |
| G. Smith, Newcastle-on-Tyne | 923 | 0 | 4 |
| J. W. Steward, Southend | 915 | 2 | 2 |
| J. W. & J. Neave,* Stratford, E. | 887 | 0 | 0 |
| W. William, Wimbledon | 881 | 0 | 0 |
| W. Armstrong, Chiswick, W. | 851 | 6 | 5 |
| G. Potter, Lower Clapton, E. | 819 | 14 | 7 |

[Surveyor's estimate, £850 0 0]

* Accepted.

For building mission hall at Merton, Surrey, for the Committee. Mr. R. B. Marsh, architect:—

| | | Extra, pitch-pine roof. | For west of chancel. |
|---|---|---|---|
| Townsend | £1,280 0 0 | £20 0 0 | £383 0 0 |
| Greenwood | 1,269 0 0 | 33 0 0 | 374 10 0 |
| Lathey Bros. | 1,230 0 0 | 30 0 0 | 359 0 0 |
| Jarrard | 1,224 0 0 | 48 0 0 | 346 0 0 |
| Fox & Palmer | 1,176 0 0 | 23 0 0 | 355 0 0 |
| Ryder Hunt | 1,170 0 0 | 28 0 0 | 350 0 0 |
| Nightingale | 1,112 0 0 | 15 0 0 | 335 0 0 |

* For a detached residence at South Hill Park, Bromley, Kent. Mr. St. Pierre Harris, architect, Basinghall-street. Messrs. Baxter, Payne, & Lepper, surveyors:—

| | | | |
|---|---|---|---|
| D. Payne | £2,200 | 0 | 0 |
| Arnand & Son | 1,898 | 0 | 0 |
| T. Crossley | 1,750 | 0 | 0 |

SPECIAL NOTICE.—Correspondents are desired to send *full lists* of persons tendering, *with the amount of each tender*. In future, *no single name will be given without the amount of the tender*, and not then unless we have the assurance of the sender that there was no competition.

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"*To the Editor of* The Builder,
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B. N.—J. G. (we give the addresses when sent).—T. A.—W. W. (not the style for our columns).—C. H. C. (thanks).—C. B. P. & Co. (our advertising columns are open).—G. R.—G. M. L.—J. H.—R. L. L.

Correspondents should address the Editor, and *not* the Publisher except in cases of business.

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

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In addition to the usual quantity of high-class and interesting literary matter, the First Number of the New Volume, to be published on FRIDAY next, will contain the following ILLUSTRATIONS, printed on fine-toned paper, viz.:—

DECORATIONS at WORTLEY HALL. Designed by E. J. POYNTER, R.A. (COLOURED Plate.)

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**Notice of Partnership.**—Mr. W. H. BARBER, Surveyor, of No. 12, Buckingham-street, Adelphi, W.C., having taken into Partnership his son, Mr. W. W. BARBER and Mr. A. BOXALL, begs to announce that on and after the 1st of January, 1884, his practice will be carried on by the firm under the name of BARBER, BOXALL, & BARBER.

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